

Site-Specific Safety and Health Plans

Former Decontamination Complex Building 1271 (Parcels 93, 46, 140, and 70)

Former Motor Pool Area 1300 (Parcels 148 and 16)

Former Motor Pool Area 600 (Parcels 149 and 136)

Motor Pool Area 800 (Parcels 164, 11, 68, and 12)

Former Gas Mask Test Chambers (Parcels 195, 196, and 198)

Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the Former Decontamination Complex
Parcels 93(7), 46(7), 140(7), and 70(7)
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
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Prepared by:

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Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645

October 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Final
Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Former Decontamination Complex at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

Date

Michael Henderson, CIH
Health & Safety Manager

Date

Jeff Tarr
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Former Decontamination Complex at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

Date

Safety and Health Plan Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Former Decontamination Complex at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

Date

Fort McClellan Gate Hours

| | |
|---------------|---|
| Baltzell Gate | Baltzell Road. Open 24 hours daily, 7 days a week. |
|---------------|---|

Fort McClellan Project Emergency Contacts

| | |
|---|----------------|
| Fire Department (on post) | Ext. 17 |
| Fire Department (off post) | (205) 820-1117 |
| Ambulance (on post) | Ext. 12 |
| Ambulance (off post) | (205) 848-2315 |
| Military Police (on post) | Ext. 5-3821 |
| Military Police (off post) | (205) 848-5555 |
| Regional Medical Center | (205) 235-5121 |
| Chemical Agent Emergencies | Ext. 17 |
| UXO Emergencies | Ext. 17 |
| UXO Nonemergencies/Reporting Only (Ronald Levy) | (205) 848-3758 |
| National Response Center | (800) 424-8802 |
| Poison Control Center | (800) 462-0800 |
| EPA Region IV | (404) 562-8725 |
| Ronald Levy, Chief, FTMC Environmental Management | (205) 848-3758 |
| Ellis Pope, U.S. Army Corps of Engineers | (334) 690-3077 |
| Jeanne Yacoub, IT Project Manager | (423) 690-3211 |
| Michael Henderson, IT H&S Manager | (423) 690-3211 |
| Dr. Elaine Theriault, IT Occupational Physician | (800) 229-3674 |

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List of Acronyms ---

| | |
|------|--|
| FTMC | Fort McClellan |
| PPE | personal protective equipment |
| SHP | installation-wide safety and health plan |
| SSHO | site safety and health officer |
| SSHP | site-specific safety and health plan |

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Former Decontamination Complex, Parcels 93(7), 140(7), 70(7), and 46(7).

Project Tasks

- Collect 24 surface soil samples.
- Collect 26 subsurface soil samples.
- Collect 6 sediment samples.
- Collect 6 surface water samples.
- Collect 9 groundwater samples.
- Collect 4 depositional soil samples.

Personnel Requirements. Up to ten employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP, FTMC, Alabama.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

The Former Decontamination Complex consisted of a gas station with two 10,000-gallon underground storage tanks, several large portable storage tanks, a chemical laundry, a bakery, a vehicle wash rack, a dump truck cleaning facility, and a decontamination apparatus branch. Chemicals suspected to have been used at these facilities include gasoline, lead, diesel fuel, chlorinated oils, toluene, ethanol, and mercuric cyanide.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Former Decontamination Complex.

2.2 General Site Information

Location of Site. The Former Decontamination Complex is located at the corner of 4th Avenue and First Street. The site covers an area of approximately 3.8 acres.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. The site elevation is approximately 740 feet, with ground sloping to the west-northwest.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|-----------------------------|-------------------------|----------------------------|--------------------------|--|--|--|-------------------------------|---------------------|-------------------------------|
| Acetone [67-64-1] | 9.7 | 13-10 | Inh Ing Con | Irritated eyes, nose, and throat; headache, dizziness; dermatitis. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 750 ppm 750 ppm 250 ppm | 1,000 ppm 1,000 ppm | PEL TLV REL | 20,000 ppm |
| Benzene [71-43-2] | 9.24 | 34-119 | Inh Abs Ing Con | Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm | 5 ppm C1 ppm (Ca) | PEL TLV REL | Ca [1,000 ppm] *OSHA |
| Ethanol | 9.51 | NA | Inh Ing Con | Irritated eyes, skin, nose; headache; cough, liver damage; anemia. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | 1,000 ppm 1,000 ppm 1,000 ppm | -- -- -- | PEL TLV REL | 3,300 ppm (LEL) |
| Ethyl benzene [100-41-4] | 8.76 | 0.09-0.6 | Inh Ing Con | Irritates eyes, mucus membranes; headache; dermatitis; narcosis, coma. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Respiratory support Immediate medical attention | 100 ppm 100 ppm 100 ppm | 125 ppm 125 ppm 125 ppm | PEL TLV REL | 2,000 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|--|-------------------------|----------------------------|--------------------|---|--|--|-------------------|---------------------|------------------------------|
| Fuel oil (diesel oil, medium) | ? | ? | Ing Inh Con | Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema, bronchopneumonia; excited, then depressed, central nervous system. | Eye: Skin: Breath: Swallow: Aspiration: Immediate medical attention | Irrigate promptly Soap wash Respiratory support Immediate medical attention | | PEL TLV REL | |
| Fuel Oil No. 1, see kerosene. [NA] | | | | | | | | PEL TLV REL | |
| Fuel Oil No. 2, see fuel oil. [NA] | | | | | | | | PEL TLV REL | |
| Fuel Oils No. 4, 5, and 6 [NA] | ? | ? | Abs Con | Low toxicity; prolonged contact may produce systemic effects. | Eye: Skin: Swallow: Immediate medical attention | Irrigate immediately (15 min) Soap wash immediately | | PEL TLV REL | |

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---|-------------------------|----------------------------|--------------------|--|--|--|-------------------------------|---------------------|------------------------------|
| Kerosene | ? | ? | Inh Ing Con | Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakness; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 mg/m ³ | | PEL TLV REL | |
| Gasoline [8006-61-9] | ? | 0.3 | Inh Ing Con | Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately (15 min) Soap wash promptly Respiratory support Immediate medical attention | 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm) | 500 ppm 500 ppm | PEL TLV REL | ? |
| n-Hexane [110-54-3] | 10.18 | 65-248 | Inh Ing Con | Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 50 ppm 50 ppm 50 ppm | | PEL TLV REL | 5,000 ppm |
| Hydrogen chloride (hydrochloric acid) [74-90-8] | 12.74 | 0.255-10.6 | Inh Ing Con | Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; In animals; laryngeal spasm; pulmonary edema. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | | C5 ppm C5 ppm C5 ppm | PEL TLV REL | 100 ppm |
| Isopropyl alcohol (isopropanol) [67-63-0] | 10.16 | 43-200 | Inh Ing Con | Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush Respiratory support Immediate medical attention | 400 ppm 400 ppm 400 ppm | 500 ppm 500 ppm 500 ppm | PEL TLV REL | 12,000 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|--|-------------------------|----------------------------|--------------------------|--|---|---|-------------------|---------------------|------------------------------|
| Lead | NA | NA | Inh Ing Con | Weak, Insomnia, facial pallor; constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.05 mg/m 0.05 mg/m 0.1 mg/m | PEL TLV REL | 100 mg/m | |
| Mercuric cyanide | NA | NA | Inh Ing Con | Violent poison. Highly toxic. | Eye: Skin: Breath: Swallow: Irrigate immediately Immediate medical attention Soap wash immediately Immediate medical attention Respiratory support Immediate medical attention Immediate medical attention | -- -- -- -- -- -- -- -- | PEL TLV REL | -- | |
| Methanol | 10.85 | 4.2-5960 | Inh Abs Ing Con | Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | 200 ppm (skin) 200 ppm (skin) 200 ppm | PEL TLV REL | 25,000 ppm | |
| Methylene chloride (dichloromethane) [75-09-2] | 11.32 | ? | Inh Ing Con | Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; Irritated eyes and skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | C1,000 ppm; C2,000 mg/m ³ (5 min in 2 hrs) | PEL TLV REL | Ca (5,000 ppm) | |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama**

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Table 2-1

Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---------------------------------|-------------------------|----------------------------|--------------------------|--|--|---|----------------------|-----------------------------|------------------------------|
| Portland cement | | | Inh | Fine gray powder that can be irritating if inhaled or in eyes. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 10 mg/m ³ / total dust 5 mg/m ³ respirable fraction | 10 mg/m ³ | TLV PEL/REL | |
| Sodium hydroxide [1310-73-2] | NA | NA | Inh Ing Con | Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | C2 mg/m ³ C2 mg/m ³ C2 mg/m ³ | PEL TLV REL | 250 mg/m ³ | |
| Sulfuric acid [7664-93-9] | ? | 0.15 | Inh Ing Con | Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | 1 mg/m ³ 1 mg/m ³ 1 mg/m ³ | 3 mg/m ³ | PEL TLV REL | 80 mg/m ³ |
| Stoddard Solvent | ? | ? | Inh Ing Con | Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 500 ppm 350 mg/m ³ | PEL TLV REL | 20,000 mg/m ³ | |
| Toluene | 8.82 | 0.16–37 | Inh Abs Ing Con | Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 ppm (skin) 50 ppm 100 ppm | 150 ppm 150 ppm | PEL TLV REL | 2,000 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA* | STEL* | Source* | IDLH (NIOSH)* |
|---|------------------------|----------------------------|--------------------------|--|---|-------------------------------|-------------------------------|-------------------|------------------|
| Xylene (o-, m-, and p-isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3] | 8.56/ 8.56/ 8.44 | 1.1-20 | Inh Abs Ing Con | Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis. | Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention | 100 ppm 100 ppm 100 ppm | 150 ppm 150 ppm 150 ppm | PEL TLV REL | 1,000 ppm |

*IP = Ionization potential (electron volts).

*Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.

*TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

*STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

*PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TEL = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

'IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 1980).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama**

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References:

- American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.
- Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
- Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
- Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 6th ed., 1998.
- Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
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- Lewis, Richard J., Sr., 1992. *Sax's Dangerous Properties of Industrial Materials*, 8th ed., Van Nostrand Reinhold, New York.
- Micromedex Toxes Plus (R) System, 1992, Micromedex, Inc.
- National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.
- National Institute for Occupational Safety and Health Standards, American Industrial Hygiene Association, 1989.
- Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1993.
- Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
- Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
- Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
- Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

| Task | Initial Level of PPE |
|--------------------|----------------------|
| Staging equipment | Level D |
| Collecting samples | Modified Level D* |

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

-
- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
 - Latex boot covers
 - Nitrile, heavy work, or latex gloves
 - Steel-toed safety boots
 - Safety glasses
 - Hard hat
 - Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from Former Decontamination Complex operations are diesel fuels, gasoline, benzene, toluene, ethyl benzene, mercuric cyanide, xylene, and lead. Table 4-1 contains action levels for site monitoring at the Former Decontamination Complex.

Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the sampling location and BZs for the combustibleflammable gas and oxygen levels that would necessitate evacuation of the work area. Table 4-2 contains the air monitoring frequency and location for site monitoring at the Former Decontamination Complex.

Table 4-1

Action Levels
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

| Analyte | Action Level | Required Action ^a |
|------------------|--|--|
| VOHs | ≥ 10 ppm above background in breathing zone (BZ) | Stop work, evacuate work area, upgrade to Level B. |
| Benzene | ≥ 5 ppm in BZ | Stop work, evacuate work area, upgrade to Level B. |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

When in Level D Modified/D PPE

| Analyte | Action Level | Required Action ^b |
|------------------|--------------------------------|---|
| VOHs | ≥ 5 ppm above background in BZ | Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE. |
| Benzene | 1 ppm in BZ | Upgrade to Level C PPE. |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

Table 4-1

**Action Levels
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

When in Support Zone

| Analyte | Action Level | Required Action |
|---------|--------------------------------|---|
| VOHs | ≥ 1 ppm above background in BZ | Evacuate support zone and re-establish perimeter of exclusion zone. |

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

**Air Monitoring Frequency and Location
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama**

| Work Activity | Instrument | Frequency | Location |
|---|--|------------------------------|----------------------------------|
| Staging equipment | OV Monitor | Initially for area | Breathing zone (BZ) of employees |
| Sampling (groundwater, surface water, sediment, and soil) | OV Monitor LEL/O ₂ Monitor | Continuously Continuously | BZ of employees Support zone |

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil, sediment, groundwater, and surface water sampling.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.

Table 5-1

**Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---------------------------------|------------------------------|--|
| Sliding equipment | Slip, trip, and fall hazards | <ul style="list-style-type: none">• Determine best access route before transporting equipment.• Practice good housekeeping; keep work area picked up and clean as feasible.• Continually inspect the work area for slip, trip, and fall hazards.• Look before you step; ensure safe and secure footing. |
| | Heavy lifting | <ul style="list-style-type: none">• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment. |
| Falling objects | | <ul style="list-style-type: none">• Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots. |
| Flying debris, dirt, dust, etc. | | <ul style="list-style-type: none">• Wear safety glasses/goggles; ensure that eye wash is in proper working condition. |
| Pinch points | | <ul style="list-style-type: none">• Keep hands, fingers, and feet clear of moving/suspended materials and equipment.• Beware of contact points.• Stay alert at all times! |
| Cuts/bruises | | <ul style="list-style-type: none">• Use cotton or leather work gloves for material handling. |
| Bees, spiders, and snakes | | <ul style="list-style-type: none">• Inspect work area carefully and avoid placing hands and feet into concealed areas. |
| Ticks | | <ul style="list-style-type: none">• Wear light colored clothing (can see ticks better).• Mow vegetated and small brush areas.• Wear insect repellent.• Wear long sleeves and long pants.• Visually check oneself promptly and frequently after exiting the work area. |
| Fire | | <ul style="list-style-type: none">• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. |
| Hazard communication | | <ul style="list-style-type: none">• Label all containers as to contents and dispose of properly.• Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site. |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 13)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|---|----------------------|
| Staging equipment (continued) | | |
| Noise | <ul style="list-style-type: none"> Sound levels above 85 decibels (dBA) mandates hearing protection. | |
| Lighting | <ul style="list-style-type: none"> Adequate lighting will be provided to ensure a safe working environment. | |
| Cold stress | <ul style="list-style-type: none"> Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. Remove wet clothing promptly. Take breaks in warm areas. Reduce work periods as necessary. Layer work clothing. | |
| Poison ivy/oak/sumac | <ul style="list-style-type: none"> Avoid plant areas if possible. Wear long sleeves and long pants. Promptly wash clothing that has contacted poisonous plants. Wash affected areas immediately with soap and water. | |
| Heat rash | <ul style="list-style-type: none"> Keep the skin clean and dry. Change perspiration-soaked clothing, as necessary. Bathe at end of work shift or day. Apply powder to affected area. | |
| Heat cramps | <ul style="list-style-type: none"> Drink plenty of cool fluids even when not thirsty. Provide cool fluid for work crews. Move victim to shaded, cool area. | |
| Heat exhaustion | <ul style="list-style-type: none"> Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). Set up work/rest periods. Use the "buddy system." Allow workers time to acclimate. Have ice packs available for use. Take frequent breaks. | |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 3 of 13)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|---|--|
| Staging equipment (continued) | Heat stroke | <ul style="list-style-type: none">Evaluate possibility of heat work.Perform physiological monitoring on workers during breaks.Wear body cooling devices. |
| | Contact with moving equipment/vehicles | <ul style="list-style-type: none">Work area will be barricaded/demarcated.Equipment will be laid out in an area free of traffic flow.Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.Barriers shall be used to protect workers from vehicular traffic.Barriers shall be used to guard excavations adjacent to streets or roadways.Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.Heavy equipment shall have backup alarms. |
| | Forklift operations | <ul style="list-style-type: none">Use qualified and trained forklift operators.The operator shall not exceed the load capacity rating for the forklift.The load capacity shall be clearly visible on the forklift.Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| | Portable electric tools | <ul style="list-style-type: none">Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.Portable electric tools and all cord and plug connected equipment shall be protected by a ground-fault circuit interrupter (GFCI) device.Electrical tools shall be inspected daily prior to use. |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 4 of 13)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|------------------------------|---|
| Staging equipment (continued) | Extension cords | <ul style="list-style-type: none">• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.• Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.• Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).• Cords shall be designed for hard duty.• Cords shall be inspected daily. |
| | Lightning strikes | <ul style="list-style-type: none">• Whenever possible, halt activities and take cover.• If outdoors, stay low to the ground.• Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground).• Seek shelter in a building if possible.• Stay away from windows.• If available, crouch under a group of trees instead of one.• Keep all body parts in contact with the ground as close as possible.• Remain 6 feet away from tree trunk if seeking shelter beneath tree(s).• If in a group, keep 6 feet of distance between people. |
| | Thunderstorms, tornadoes | <ul style="list-style-type: none">• Listen to radio or TV announcements for pending weather information.• Cease field activities during thunderstorm or tornado warnings.• Seek shelter. Do not try to outrun a tornado. |
| Surveying | Slip, trip, and fall hazards | <ul style="list-style-type: none">• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field.• Provide adequate lighting in all work areas.• Whenever possible, avoid routing cords and hoses across walking pathways.• Flag or cover inconspicuous holes to protect against falls.• Work areas will be kept clean and orderly.• Garbage and trash will be disposed of daily in approved refuse containers.• Tools and accessories will be properly maintained and stored.• Work areas and floors will be kept free of dirt, grease, and slippery materials. |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 5 of 13)

| Activity | Potential Hazards | Recommended Controls |
|-----------------------|----------------------|---|
| Surveying (continued) | Traffic accidents | <ul style="list-style-type: none">• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians.• If working adjacent to roadways, have workers wear fluorescent orange vests.• Use warning signs or lights to alert oncoming traffic.• Assign flag person(s) if necessary to direct local traffic.• Set up temporary parking locations outside the immediate work area.• Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits.• Pedestrians have the right-of-way.• Wear seat belts when vehicles are in motion. |
| | Wildlife hazards | <ul style="list-style-type: none">• Workers should be cautious when driving through the site in order to avoid encounters with passing animals. |
| | Biological hazards | <ul style="list-style-type: none">• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads). |
| | Ticks | <ul style="list-style-type: none">• Wear light colored clothing (can see ticks better).• Mow vegetated and small brush areas.• Wear insect repellent.• Wear long sleeves and long pants.• Visually check oneself promptly and frequently after exiting the work area. |
| | Poison ivy/oak/sumac | <ul style="list-style-type: none">• Avoid plant areas if possible.• Wear long sleeves and long pants.• Promptly wash clothing that has contacted poisonous plants.• Wash affected areas immediately with soap and water. |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 6 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---------------------------|---|--|
| Groundwater sampling | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none">Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.Avoid skin contact with water.Handle samples with care.Only essential personnel will be in the work area.Real-time air monitoring will take place before and during sampling activities.All personnel will follow good hygiene practices.Proper decontamination procedures will be followed.All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">Use care when handling glassware.Wear adequate hand protection. |
| Hazard communication | | <ul style="list-style-type: none">MSDSs shall be obtained for chemicals brought on site.Label all containers as to contents. |
| Strains/sprains | | <ul style="list-style-type: none">Use the proper tool for the job being performed.Get assistance if needed.Avoid twisting/turning while pulling on tools, moving equipment, etc. |
| Spills/residual materials | | <ul style="list-style-type: none">Absorbent material and containers will be kept available where leaks or spills may occur. |
| Lighting | | <ul style="list-style-type: none">Adequate lighting will be provided to ensure a safe working environment. |
| Unattended worker | | <ul style="list-style-type: none">Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities. |

Table 5-1

**Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|---|--|
| Soil boring and surface/subsurface sampling | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none">Stop immediately at any sign of obstruction.Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.Only essential personnel will be in the work area.Real-time air monitoring will take place before and during sampling activities.All personnel will follow good hygiene practices.Proper decontamination procedures will be followed.All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">Use care when handling glassware.Wear adequate hand protection. |
| Slip, trip, and fall hazards | | <ul style="list-style-type: none">Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field.Whenever possible, avoid routing cords and hoses across walking pathways.Flag or cover inconspicuous holes to protect against falls. |
| Bees, spiders, and snakes | | <ul style="list-style-type: none">Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas.Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms. |
| Poison ivy/oak/sumac | | <ul style="list-style-type: none">Avoid plant areas if possible.Wear long sleeves and long pants.Promptly wash clothing that has contacted poisonous plants.Wash affected areas immediately with soap and water. |
| Cold stress | | <ul style="list-style-type: none">Workers should wear insulated clothing when temperatures drop below 40°F.Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.Remove wet clothing promptly.Take breaks in warm areas.Reduce work periods as necessary.Layer work clothing. |

Table 5-1

**Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama**

(Page 8 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|-----------------------|---|
| Soil boring and surface/subsurface sampling (continued) | Access/egress hazards | <ul style="list-style-type: none">• Use qualified and trained bushhog operator.• Keep employees out of the bushhog work area.• Utilize good housekeeping practices.• Keep aisleways, pathways, and work areas free of obstruction.• Clean ice or snow off of walkways or work stations.• Use appropriate footwear for the task assigned. |
| Heat rash | | <ul style="list-style-type: none">• Keep the skin clean and dry.• Change perspiration-soaked clothing, as necessary.• Bathe at end of work shift or day.• Apply powder to affected area. |
| Heat cramps | | <ul style="list-style-type: none">• Drink plenty of cool fluids even when not thirsty.• Provide cool fluid for work crews.• Move victim to shaded, cool area. |
| Heat exhaustion | | <ul style="list-style-type: none">• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).• Set up work/rest periods.• Use the buddy system.• Allow workers time to acclimate.• Have ice packs available for use.• Take frequent breaks. |
| Heat stroke | | <ul style="list-style-type: none">• Evaluate possibility of night work.• Perform physiological monitoring on workers during breaks.• Wear body cooling devices. |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 9 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|---|----------------------|
| Soil boring and surface/subsurface sampling (continued) | <p>Lightning strikes</p> <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people. | |
| Surface water/sediment sampling | <p>Drowning</p> <ul style="list-style-type: none"> • Personal flotation devices (PFD) will be provided and worn by workers over or near water where the danger of drowning exists. • PFDs shall be inspected prior to and after each use. • Detective PFDs will be tagged and removed from service. • Ring buoys with at least 90 feet of line shall be provided and readily available at locations where employees are working over or adjacent to water. • Use the "buddy system." • Personnel trained in launching and operating the skiff shall be readily available during work hours. | |
| Moving and shipping collected samples | <p>Heavy lifting</p> <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. <p>Pinch points</p> <ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times! <p>Cut hazards</p> <ul style="list-style-type: none"> • Wear adequate hand protection. Use care when handling glassware. <p>Hazard communication</p> <ul style="list-style-type: none"> • Label all containers as to contents and associated hazards. <p>Heavy lifting</p> <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; • size-up the lift. | |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 10 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|--|--|
| Material storage | Flammable and combustible liquids | <ul style="list-style-type: none"> Store in NO SMOKING AREA. Fire extinguisher readily available. Transfer only when properly grounded and bonded. |
| Disposal of investigation-derived waste (IDW) (Forklift Operation) | Personnel injury, property damage, and/or equipment damage | <ul style="list-style-type: none"> Use qualified and trained forklift operators. The operator shall not exceed the load capacity rating for the forklift. The load capacity shall be clearly visible on the forklift. Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Cross-contamination and contact with potentially contaminated materials | | <ul style="list-style-type: none"> Stop immediately at any sign of obstruction. Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. Only essential personnel will be in the work area. Real-time air monitoring will take place before and during sampling activities. All personnel will follow good hygiene practices. Proper decontamination procedures will be followed. All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none"> Use care when handling glassware. Wear adequate hand protection. |
| Heavy lifting operations | Heavy lifting | <ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. |
| High-pressure water jetting operations | Slip, trip, and fall hazards | <ul style="list-style-type: none"> Good housekeeping shall be implemented. The work area shall be kept clean as feasible. Inspect the work area for slip, trip, and fall hazards. |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

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| Activity | Potential Hazards | Recommended Controls |
|--|--|----------------------|
| High-pressure water jetting operations (continued) | <p>Fueling</p> <ul style="list-style-type: none"> Only approved safety cans shall be used to store fuel. Do not refuel equipment while it is operating. Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. | |
| Faulty or damaged equipment | <ul style="list-style-type: none"> Equipment shall be inspected before being placed into service and at the beginning of each shift. Preventive maintenance procedures recommended by the manufacturer shall be followed. A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance. | |
| High-pressure water | <ul style="list-style-type: none"> Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). One standby person shall be available within the vicinity of the pump during jetting operation. The work area shall be isolated and adequate barriers will be used to warn other site personnel. | |
| Unqualified operators | <ul style="list-style-type: none"> Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning. | |
| Out of control equipment | <ul style="list-style-type: none"> No machinery or equipment is permitted to run unattended. Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded. | |
| Noise | <ul style="list-style-type: none"> Sound levels above 85 dBA mandates hearing protection by nearby site personnel. | |
| Activation during repairs | <ul style="list-style-type: none"> All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. | |
| Pinch points | <ul style="list-style-type: none"> Keep feet and hands clear of moving/suspended materials and equipment. Stay alert and clear of materials suspended. | |
| Falling objects | <ul style="list-style-type: none"> Hard hats are required by site personnel. Stay alert and clear of material suspended overhead. | |
| Flying debris | <ul style="list-style-type: none"> Impact-resistant safety glasses with side shields are required. | |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 12 of 13)

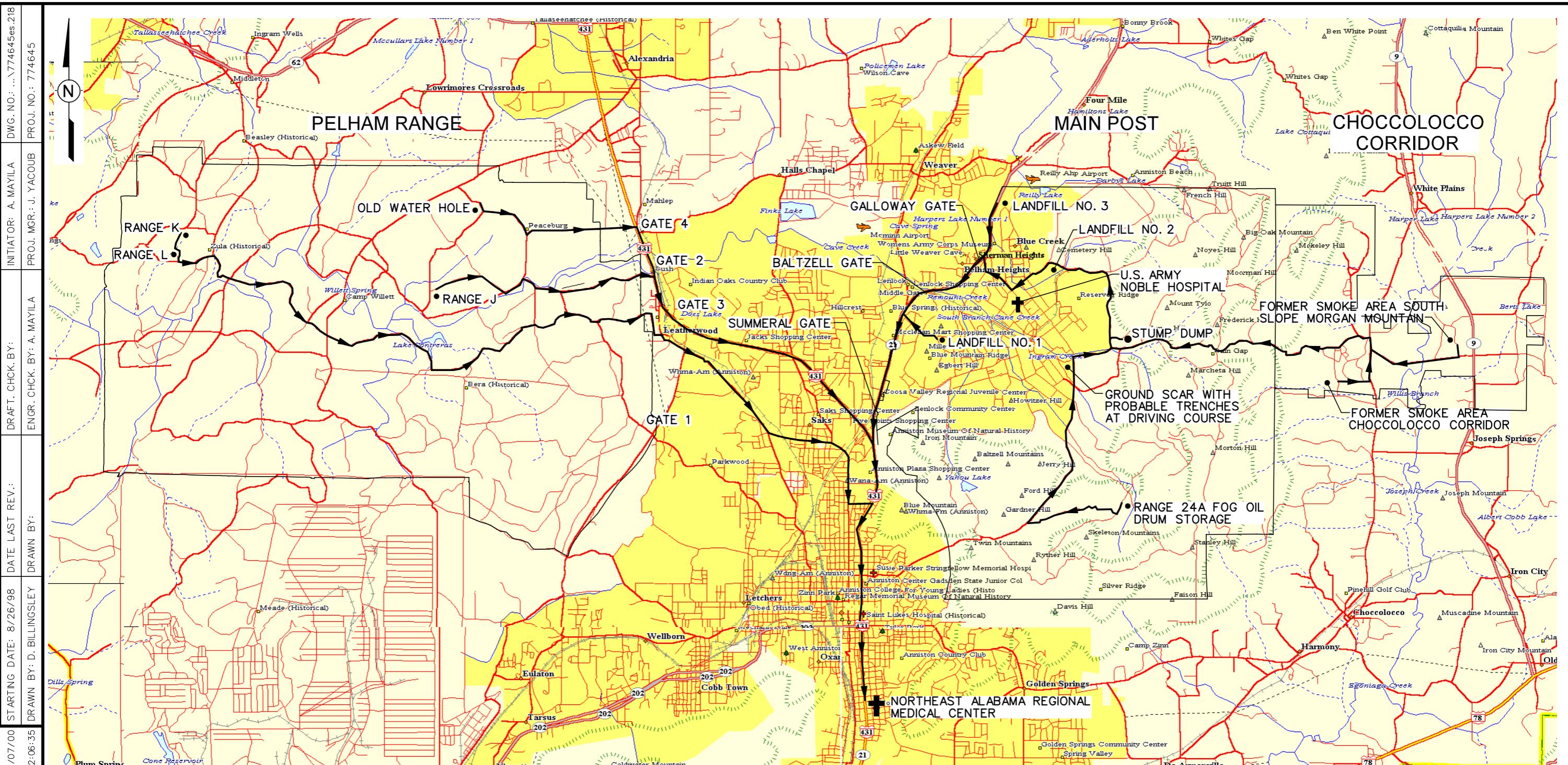
| Activity | Potential Hazards | Recommended Controls |
|--|--|--|
| High-pressure water jetting operations (continued) | Contact with potentially contaminated materials | <ul style="list-style-type: none"> All site personnel will wear the appropriate PPE. |
| Hydropunch sampling | Faulty or damaged equipment being utilized to perform work | <ul style="list-style-type: none"> All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition. Equipment will be inspected before use and at the beginning of each shift. Faulty/unsafe equipment will be tagged and if possible locked out. Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so. |
| | Uneven terrain, poor ground support, inadequate clearances, contact with utilities | <ul style="list-style-type: none"> Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. All mobile equipment and areas in which they are operated shall be adequately illuminated. Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines will have the wheels chocked. Inspect brakes and tire pressure on drill rig before staging for work. Obtain trenching/drilling permit prior to operation. |
| Inexperienced operator | | <ul style="list-style-type: none"> Machinery and mechanized equipment shall be operated only by designated personnel. Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement. |
| Jacks/outriggers | | <ul style="list-style-type: none"> Ensure proper footing and cribbing. |
| Falling objects | | <ul style="list-style-type: none"> Remove unsecured tools and materials before raising or lowering the derrick. Stay alert and clear of materials suspended overhead. |

Table 5-1

Activity Hazard Analysis
Former Decontamination Complex
Parcels 93(7), 140(7), 70(7), and 46(7)
Fort McClellan, Calhoun County, Alabama

(Page 13 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|---|----------------------|
| Hydropunch sampling (continued) | | |
| Pinch points | <ul style="list-style-type: none">• Keep feet and hands clear of moving/suspended materials and equipment.• Stay alert at all times! | |
| Fire | <ul style="list-style-type: none">• Mechanized equipment shall be shut down prior to and during fueling operations.• Have fire extinguishers inspected and readily available. | |
| Fall hazards | <ul style="list-style-type: none">• Personnel are not allowed to work off of machinery or use them as ladders.• Use fall protection when working above 6 feet. | |
| Noise | <ul style="list-style-type: none">• Hearing protection is mandatory above 85 dBA. | |
| Contact with rotating or reciprocating machine part | <ul style="list-style-type: none">• Use machine guards; use long-handled shovels to remove auger cuttings.• Safe lockout procedures for maintenance work. | |
| Heavy lifting | <ul style="list-style-type: none">• Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift. | |
| Slip, trip, and fall hazards | <ul style="list-style-type: none">• Practice good housekeeping; keep work area picked up and clean as feasible.• Continually inspect the work area for slip, trip, and fall hazards. | |
| Contact with potentially contaminated materials | <ul style="list-style-type: none">• Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized. | |



LEGEND

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
 - 431 U.S. HIGHWAY
 - ✚ HOSPITALS
 - INVESTIGATION SITES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

FIGURE 1 HOSPITAL EMERGENCY ROUTES

**Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

October 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Final
Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Former Motor Pool Area 1300, Parcels 148(7) and 16(7) at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

Date

Michael Henderson, CIH
Health & Safety Manager

Date

Jeff Tarr
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Former Motor Pool Area 1300, Parcel 148(7) and 16(7) at Fort McClellan, Alabama has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

Date

Site-Specific Safety and Health Plan

Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Former Motor Pool Area 1300, Parcels 148(7) and 16(7) at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

Date

Fort McClellan Gate Hours

| | |
|---------------|---|
| Baltzell Gate | Baltzell Road. Open 24 hours daily, 7 days a week. |
|---------------|---|

Fort McClellan Project Emergency Contacts

| | |
|--|----------------|
| Fire Department (on post) | Ext. 17 |
| Fire Department (off post) | (205) 820-1117 |
| Ambulance (on post) | Ext. 12 |
| Ambulance (off post) | (205) 848-2315 |
| Military Police (on post) | Ext. 5-3821 |
| Military Police (off post)..... | (205) 848-5555 |
| Regional Medical Center | (205) 235-5121 |
| Chemical Agent Emergencies | Ext. 17 |
| UXO Emergencies | Ext. 17 |
| UXO Nonemergencies/Reporting Only (Ronald Levy) | (205) 848-3758 |
| National Response Center | (800) 424-8802 |
| Poison Control Center..... | (800) 462-0800 |
| EPA Region IV | (404) 562-8725 |
| Ronald Levy, Chief, FTMC Environmental Management..... | (205) 848-3758 |
| Ellis Pope, U.S. Army Corps of Engineers | (334) 690-3077 |
| Jeanne Yacoub, IT Project Manager | (423) 690-3211 |
| Michael Henderson, IT H&S Manager | (423) 690-3211 |
| Dr. Elaine Theriault, IT Occupational Physician | (800) 229-3674 |

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List of Acronyms ---

| | |
|------|--|
| BZ | breathing zone |
| FTMC | Fort McClellan |
| IT | IT Corporation |
| PPE | personal protective equipment |
| SHP | installation-wide safety and health plan |
| SSHO | site safety and health officer |
| SSHP | site-specific safety and health plan |
| UST | underground storage tank |

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Former Motor Pool Area 1300, Parcels 148(7) and 16(7).

Project Tasks

- Collect 12 surface soil samples.
- Collect 10 subsurface soil samples.
- Collect 2 sediment samples.
- Collect 2 surface water samples.
- Collect 8 groundwater samples.
- Collected 1 depositional sample.

Personnel Requirements. Up to 10 employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP).

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

The Former Motor Pool Area 1300, Parcel 148(7) was historically identified as a Motor Park. Light vehicle maintenance may have been performed here; however, the motor pool is primarily used for vehicle storage. The Community Environmental Response Facilitation Act Parcel Descriptions indicate that a wash rack and oil/water separator were located here. Evidence of neither the wash rack nor the oil/water separator was observed on April 21, 1998. Building 1398 is the only structure still standing. A small concrete pad is located approximately at the center of the west boundary. To the southeast of that pad is a larger concrete pad, and a few feet further south, is an oblong concrete slab. The area adjacent to and behind (east) these structures is soggy and covered with large grasses. Parallel to the east boundary is a wooded marshy area and a small stream flowing north. The north end of the parcel is paved and bounded to the north by trees. The paved area extends beyond (to the south) Building 1398 for approximately 40 feet. A potential underground tank location is noted in the environmental baseline survey as Parcel 16(7). This potential tank is approximately at the center of the west boundary near the road and near the small concrete pad. Information is not available to confirm that the original tanks have been removed, and it is unknown if they are removed or are still in place. The small concrete pad is evidence of a former gas station constructed in 1941. The building was a 9 by 21-foot cement foundation with corrugated steel walls. The original plans called for two 10,000-gallon tanks. None of these buildings currently exist and the status of the underground storage tanks (UST) is, for the most part, unevaluated. The USTs are reported to be located in front of the building. Closure reports are not on file at FTMC or the Alabama Department of Environmental Management and may not have been required at the time of closure. Two 5,000-gallon tanks are reported to have been removed in 1991, but closure reports are not on file. It is unknown if two 5,000-gallon tanks were installed rather than two 10,000-gallon tanks. Therefore, it is unknown if two 10,000-gallon tanks remain at the site. Evidence of the tanks was not seen during the site walkover. The south end of the parcel is grassy and has been used as a softball/baseball field.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Former Motor Pool Area 1300, Parcels 148(7) and 16(7).

2.2 General Site Information

Location. The Former Motor Pool Area 1300, Parcels 148(7) and 16(7), is bounded by Fourth Street on the north, Third Avenue on the east, Ninth Avenue on the south, and Fourth Avenue on the west.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. Site elevation is approximately 760 feet and the surface drainage is to the southeast.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source* | IDLH (NIOSH) ^e |
|---|----------------------|----------------------|--------------------------|--|---|--|-------------------------------|-------------------|-----------------------------|
| Acetone [67-64-1] | 9.7 | 13-100 | Inh Abs Ing Con | Irritated eyes, nose, and throat; headache, dizziness; dermatitis. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 750 ppm 750 ppm 250 ppm | 1,000 ppm 1,000 ppm | PEL TLV REL | 20,000 ppm |
| Arsenic and soluble inorganic compounds (as As) [7740-38-2] | NA | NA | Inh Abs Ing Con | Ulceration of nasal septum, dermatitis, gastrointestinal disturbances; hyperpigmentation of the skin (carcinogenic); peripheral neuropathy, respiratory irritation. | Eye: Skin: Breath: Swallow: Irrigate immediately (15 min) Soap wash immediately Immediate medical attention | 0.01 mg/m ³ 0.2 mg/m ³ (Ca-29 CFR 1910.1018 Inorganic compounds) | 0.002 mg/m ³ | PEL TLV REL | Ca [100 mg/m ³] |
| Benzene [71-43-2] | 9.24 | 34-119 | Inh Abs Ing Con | Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm | 5 ppm C1 ppm (Ca) | PEL TLV REL | Ca [1,000 ppm] *OSHA |
| 1,2-Dichloroethane (ethylene dichloride) [107-06-02] | 11.05 | ? | Inh Abs Ing Con | Depressed central nervous system, nausea, vomiting, dermatitis, irritated eyes, corneal opacity. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 1 ppm 10 ppm 1 ppm | 2 ppm 2 ppm | PEL TLV REL | Ca [1,000] |
| 1,2-Dichloroethylene [540-59-0] | 9.65 | 17 | Inh Abs Ing Con | Irritated eyes and respiratory system; depressed central nervous system. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 200 ppm 200 ppm 200 ppm | 200 ppm 200 ppm 200 ppm | PEL TLV REL | 4,000 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---|-------------------------|----------------------------|--------------------|---|--|---|-------------------------------|-------------------------------|------------------------------|
| Dichloromethane, see methylene chloride | | | | | | | | | |
| Ethyl benzene [100-41-4] | 8.76 | 0.09-0.6 | Inh Ing Com | Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma. | Eye: Skin: Breath: Swallow: | Irrigate immediately Water flush promptly Respiratory support Immediate medical attention | 100 ppm 100 ppm 100 ppm | 125 ppm 125 ppm 125 ppm | PEL TLV REL |
| Fuel oil (diesel oil, medium) | ? | ? | Ing Inh Com | Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, sub- sternal stress, pulmonary edema, bronchopneumonia; excited, then depressed, central nervous system. | Eye: Skin: Breath: Swallow: Aspiration: Immediate medical attention | Irrigate promptly Soap wash Respiratory support Immediate medical attention | | | PEL TLV REL |
| Fuel Oil No. 1, see kerosene. [NA] | | | | | | | | | PEL TLV REL |
| Fuel Oil No. 2, see fuel oil. [NA] | | | | | | | | | PEL TLV REL |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---|----------------------|----------------------|--------------------|--|---|--|----------------------------|---------------------|---------------------------|
| Fuel Oils No. 4, 5, and 6 [NA] | ? | ? | Abs Con | Low toxicity; prolonged contact may produce systemic effects. | Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention | | | PEL TLV REL | |
| Kerosene | ? | ? | Inh Ing Con | Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakness; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia. | Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention | 100 mg/m ³ | | PEL TLV REL | |
| Gasoline [8000-61-9] | ? | 0.3 | Inh Ing Con | Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential Kidney and other cancers. Carcinogenic. | Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention | 300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm) | 500 ppm 500 ppm | PEL TLV REL | ? |
| n-Hexane [110-54-3] | 10.18 | 65-248 | Inh Ing Con | Lightheadedness; nausea, headache; numbness of the extremities; muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness. | Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention | | 50 ppm 50 ppm 50 ppm | PEL TLV REL | 5,000 ppm |
| Hydrogen chloride (hydrochloric acid) [74-90-8] | 12.74 | 0.255-10.6 | Inh Ing Con | Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema. | Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention | | C5 ppm C5 ppm C5 ppm | PEL TLV REL | 100 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source* | IDLH (NIOSH) ^e |
|--|----------------------|----------------------|--------------------------|--|--|------------------------------------|---|-------------------|---------------------------|
| Isopropyl alcohol (isopropanol) [67-63-0] | 10.16 | 43-200 | Inh Ing Con | Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush Respiratory support Immediate medical attention | 400 ppm 400 ppm 400 ppm | 500 ppm 500 ppm 500 ppm | PEL TLV REL | 12,000 ppm |
| Lead [7439-92-1] | NA | NA | Inh Ing Con | Weak, insomnia, facial pallor, constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.05 mg/m 0.05 mg/m 0.1 mg/m | | PEL TLV REL | 100 mg/m |
| Methanol | 10.85 | 4.2-5960 | Inh Abs Ing Con | Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | | 200 ppm (skin) 200 ppm (skin) 200 ppm | PEL TLV REL | 25,000 ppm |
| Methylene chloride (dichloromethane) [75-09-2] | 11.32 | ? | Inh Ing Con | Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 500 ppm 50 ppm | C1,000 ppm; C2,000 mg/m ³ (5 min in 2 hrs) | PEL TLV REL | Ca (5,000 ppm) |
| Methyl ethyl ketone [78-93-3] | 9.54 | 2-85 | Inh Ing Con | Irritated eyes and nose; headache, dizziness; vomiting. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | 200 ppm 200 ppm 200 ppm | 300 ppm 300 ppm 300 ppm | PEL TLV REL | 3,000 ppm |
| Motor oil [NA] | ? | ? | Inh Ing | Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested. | Eye: Skin: Swallow: Irrigate immediately (15 min) Soap wash immediately Immediate medical attention | | | PEL TLV REL | |

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 5 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|--|-------------------------|----------------------------|--------------------|--|--|--|----------------------------------|---------------------|------------------------------|
| Naphtha, see petroleum distillate | | | | | | | | | |
| Nitric acid [7697-37-2] | 11.95 | 0.3-1 | Inh Ing Con | Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion. | Eye: Skin: Breath: Swallow: Immediate medical attention | 2 ppm 2 ppm 2 ppm | 4 ppm 4 ppm 4 ppm | PEL TLV REL | 100 ppm |
| Petroleum distillate (Naphtha) [8002-05-9] | ? | ? | Con Ing | Coughing, dyspnea, nausea, or vomiting. | Eye: Skin: Breath: Swallow: Immediate medical attention | 400 ppm | | PEL TLV REL | |
| Petroleum hydrocarbons, see Stoddard solvent | | | | | | | | | |
| Phosgene (CG) | ? | ? | Inh Con | Irritated eyes, nose and upper respiratory tract; wheezing and difficulty in breathing; eye and skin burns; pulmonary edema. | Eye: Skin: Breath: | 0.1 ppm 0.1 ppm 0.1 ppm | 15-minute ceiling: 0.2 ppm | PEL TLV REL | 2 ppm |
| Portland cement | | | Inh | Fine gray powder that can be irritating if inhaled or in eyes. | Eye: Skin: Breath: Swallow: Immediate medical attention | 10 mg/m ³ 10 mg/m ³ /total dust 5 mg/m ³ respirable fraction | | TLV PEL/REL | |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|--|----------------------|----------------------|--------------------------|---|---|---|--|---------------------|---------------------------|
| Sodium hydroxide [1310-73-2] | NA | NA | Inh Ing Con | Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair. | Eye: Skin: Breath: Swallow: Attention | Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | C2 mg/m ³ C2 mg/m ³ C2 mg/m ³ | PEL TLV REL | 250 mg/m ³ |
| Sulfuric acid [7664-93-9] | ? | 0.15 | Inh Ing Con | Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis. | Eye: Skin: Breath: Swallow: Attention | Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | 1 mg/m ³ 1 mg/m ³ 1 mg/m ³ | PEL TLV REL | 80 mg/m ³ |
| Stoddard Solvent | ? | ? | Inh Ing Con | Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia. | Eye: Skin: Breath: Swallow: Attention | Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 500 ppm 350 mg/m ³ | PEL TLV REL | 20,000 mg/m ³ |
| Tetrachloroethylene (perchloroethylene) [127-18-4] | 9.32 | 47 | Inh Ing Con | Irritates eyes, nose, throat; nausea; flushed face, neck; vertigo, dizziness, incoordination; headache, sleepiness; skin redness; liver damage, suspected human carcinogen. | Eye: Skin: Breath: Swallow: Attention | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 25 ppm 50 ppm | PEL TLV REL | Ca [500 ppm] |
| Toluene | 8.82 | 0.16-37 | Inh Abs Ing Con | Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis. | Eye: Skin: Breath: Swallow: Attention | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 ppm (skin) 50 ppm (skin) 100 ppm | PEL TLV REL | 2,000 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---|------------------------|----------------------|--------------------------|---|--|--|--------------------------------|---------------------|---------------------------|
| 1,1,1-Trichloroethane (methyl chloroform) [71-55-6] | 11.0 | 390 | Inh Ing Con | Headache, lassitude, central nervous system depression, poor equilibrium; irritated eyes; dermatitis; cardiac arrhythmia. | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 350 ppm 350 ppm | 450 ppm 450 ppm C350 ppm | PEL TLV REL | 1,000 ppm |
| Trichloroethylene, see Trichloroethylene [79-01-6] | | | | | | | | | |
| Trichloroethylene (TCE, trichloroethylene) [79-01-6] | 9.45 | 21.4 | Inh Ing Con | Headache, vertigo; visual disturbance, tremors, somnolence, nausea, vomiting; irritated eyes; dermatitis; cardiac arrhythmia, paresthesia. Carcinogenic. | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 50 ppm 50 ppm 25 ppm | 200 ppm 200 ppm Ca | PEL TLV REL | Ca [1,000 ppm] |
| 2,4,6-Trinitrotoluene (TNT) [118-96-7] | 10.59 | ? | Inh Abs Ing Con | Liver damage, jaundice; cyanosis; sneezing, coughing, sore throat; peripheral neuropathy, muscular pain; kidney damage; cataract; sensitive dermatitis; leukocytosis; anemia; cardiac irregularities. | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.5 mg/m ³ (skin) 0.5 mg/m ³ (skin) 0.5 mg/m ³ (skin) | | PEL TLV REL | NE |
| Xylene (o-, m-, and p-isomers) [1330-20-7; 95-47-6; 108-38-3; 106-42-3] | 8.56/ 8.56/ 8.44 | 1.1-20 | Inh Abs Ing Con | Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis. | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 ppm 100 ppm 100 ppm | 150 ppm 150 ppm 150 ppm | PEL TLV REL | 1,000 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

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^aIP = Ionization potential (electron volts).

^bTWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

^cSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

^dPEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

^eIDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-imparing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 1998).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

References:

- American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.
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Micromedex Toxics Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

| Task | Initial Level of PPE |
|--------------------|----------------------|
| Staging equipment | Level D |
| Collecting samples | Modified Level D* |

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

-
- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
 - Latex boot covers
 - Nitrile, heavy work, or latex gloves
 - Steel-toed safety boots
 - Safety glasses
 - Hard hat
 - Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from Former Motor Pool Area 1300 operations are diesel fuels, benzene, ethyl benzene, toluene, xylene, and lead. Table 4-1 contains action levels for site monitoring at the Former Motor Pool Area 1300.

Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen monitor will be utilized to monitor the sampling locations and BZs to determine if any combustible/flammable gases or oxygen levels may be present that would necessitate evacuating the site. Table 4-2 contains the air monitoring frequency and location for site monitoring at the Former Motor Pool Area 1300.

Table 4-1
Action Levels
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

| Analyte | Action Level | Required Action ^a |
|------------------|---|--|
| VOHs | ≥ 10 ppm above background in BZ | Stop work, evacuate work area, upgrade to Level B. |
| Benzene | ≥ 5 ppm in BZ | Stop work, evacuate work area, upgrade to Level B. |
| Oxygen | $\geq 20\%$, $<23\%$ $< 20\%$, $>23\%$ | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | $\geq 10\%$ LEL $< 10\%$ LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

When in Level D Modified/D PPE

| Analyte | Action Level | Required Action ^b |
|------------------|---|---|
| VOHs | ≥ 5 ppm above background in BZ | Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE. |
| Benzene | 1 ppm in BZ | Upgrade to Level C PPE. |
| Oxygen | $\geq 20\%$, $<23\%$ $< 20\%$, $>23\%$ | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | $\geq 10\%$ LEL $< 10\%$ LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

Table 4-1
Action Levels
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

When in Support Zone

| Analyte | Action Level | Required Action |
|---------|--------------------------------|---|
| VOHs | ≥ 1 ppm above background in BZ | Evacuate support zone and re-establish perimeter of exclusion zone. |

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2
Air Monitoring Frequency and Location
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

| Work Activity | Instrument | Frequency | Location |
|---|--|------------------------------|----------------------------------|
| Staging equipment | OV Monitor | Initially for area | Breathing zone (BZ) of employees |
| Sampling (groundwater, surface water, sediment, and soil) | OV Monitor LEL/O ₂ Monitor | Continuously Continuously | BZ of employees Support zone |

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil, sediment, groundwater, and surface water sampling.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---------------------------------|------------------------------|--|
| Staging Equipment | Slip, trip, and fall hazards | <ul style="list-style-type: none">Determine best access route before transporting equipment.Practice good housekeeping; keep work area picked up and clean as feasible.Continually inspect the work area for slip, trip, and fall hazards.Look before you step; ensure safe and secure footing. |
| Heavy lifting | | <ul style="list-style-type: none">Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment. |
| Falling objects | | <ul style="list-style-type: none">Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots. |
| Flying debris, dirt, dust, etc. | | <ul style="list-style-type: none">Wear safety glasses/goggles; ensure that eye wash is in proper working condition. |
| Pinch points | | <ul style="list-style-type: none">Keep hands, fingers, and feet clear of moving/suspended materials and equipment.Beware of contact points.Stay alert at all times! |
| Cuts/bruises | | <ul style="list-style-type: none">Use cotton or leather work gloves for material handling. |
| Bees, spiders, and snakes | | <ul style="list-style-type: none">Inspect work area carefully and avoid placing hands and feet into concealed areas. |
| Ticks | | <ul style="list-style-type: none">Wear light colored clothing (can see ticks better).Mow vegetated and small brush areas.Wear insect repellent.Wear long sleeves and long pants.Visually check oneself promptly and frequently after exiting the work area. |
| Fire | | <ul style="list-style-type: none">Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. |
| Hazard communication | | <ul style="list-style-type: none">Label all containers as to contents and dispose of properly.Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 12)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|--|----------------------|
| Staging Equipment (continued) | | |
| Noise | <ul style="list-style-type: none">Sound levels above 85 decibels (dBA) mandates hearing protection. | |
| Lighting | <ul style="list-style-type: none">Adequate lighting will be provided to ensure a safe working environment. | |
| Cold stress | <ul style="list-style-type: none">Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F).Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.Remove wet clothing promptly.Take breaks in warm areas.Reduce work periods as necessary.Layer work clothing. | |
| Poison ivy/oak/sumac | <ul style="list-style-type: none">Avoid plant areas if possible.Wear long sleeves and long pants.Promptly wash clothing that has contacted poisonous plants.Wash affected areas immediately with soap and water. | |
| Heat rash | <ul style="list-style-type: none">Keep the skin clean and dry.Change perspiration-soaked clothing, as necessary.Bathe at end of work shift or day.Apply powder to affected area. | |
| Heat cramps | <ul style="list-style-type: none">Drink plenty of cool fluids even when not thirsty.Provide cool fluid for work crews.Move victim to shaded, cool area. | |
| Heat exhaustion | <ul style="list-style-type: none">Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).Set up work/rest periods.Use the "buddy system."Allow workers time to acclimate.Have ice packs available for use.Take frequent breaks. | |
| Heat stroke | <ul style="list-style-type: none">Evaluate possibility of night work.Perform physiological monitoring on workers during breaks.Wear body cooling devices. | |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 3 of 12)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|--|--|
| Staging Equipment (continued) | Contact with moving equipment/vehicles | <ul style="list-style-type: none">Work area will be barricaded/demarcated.Equipment will be laid out in an area free of traffic flow.Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.Barriers shall be used to protect workers from vehicular traffic.Barriers shall be used to guard excavations adjacent to streets or roadways.Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.Heavy equipment shall have backup alarms. |
| Forklift operations | | <ul style="list-style-type: none">Use qualified and trained forklift operators.The operator shall not exceed the load capacity rating for the forklift.The load capacity shall be clearly visible on the forklift.Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Portable electric tools | | <ul style="list-style-type: none">Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter device.Electrical tools shall be inspected daily prior to use. |
| Extension cords | | <ul style="list-style-type: none">Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).Cords shall be designed for hard duty.Cords shall be inspected daily. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 4 of 12)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|--|---|
| Staging Equipment (continued) | <p>Lightning strikes</p> <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people. | |
| Thunderstorms, tornadoes | <ul style="list-style-type: none"> • Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado. | |
| Surveying | <ul style="list-style-type: none"> • Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials. | |
| Traffic accidents | <ul style="list-style-type: none"> • Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion. | |
| Wildlife hazards | | <ul style="list-style-type: none"> • Workers should be cautious when driving through the site in order to avoid encounters with passing animals. |

Table 5-1

**Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 12)

| Activity | Potential Hazards | Recommended Controls |
|-----------------------|----------------------|---|
| Surveying (continued) | Biological hazards | <ul style="list-style-type: none"> • Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads). |
| | Ticks | <ul style="list-style-type: none"> • Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellent. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area. |
| | Poison ivy/oak/sumac | <ul style="list-style-type: none"> • Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water. |
| | Groundwater Sampling | <ul style="list-style-type: none"> • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| | Cut hazards | <ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection. |
| | Hazard communication | <ul style="list-style-type: none"> • MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents. |
| | Strains/sprains | <ul style="list-style-type: none"> • Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 6 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|---|--|
| Groundwater Sampling (continued) | | |
| Spills/residual materials | <ul style="list-style-type: none">Absorbent material and containers will be kept available where leaks or spills may occur. | |
| Lighting | <ul style="list-style-type: none">Adequate lighting will be provided to ensure a safe working environment. | |
| Unattended worker | <ul style="list-style-type: none">Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities. | |
| Soil Boring and Surface/Subsurface Sampling | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none">Stop immediately at any sign of obstruction.Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.Only essential personnel will be in the work area.Real-time air monitoring will take place before and during sampling activities.All personnel will follow good hygiene practices.Proper decontamination procedures will be followed.All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">Use care when handling glassware.Wear adequate hand protection. |
| Slip, trip, and fall hazards | | <ul style="list-style-type: none">Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field.Whenever possible, avoid routing cords and hoses across walking pathways.Flag or cover inconspicuous holes to protect against falls. |
| Bees, spiders, and snakes | | <ul style="list-style-type: none">Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas.Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms. |
| Poison ivy/oak/sumac | | <ul style="list-style-type: none">Avoid plant areas if possible.Wear long sleeves and long pants.Promptly wash clothing that has contacted poisonous plants.Wash affected areas immediately with soap and water. |

Table 5-1

**Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|-----------------------|---|
| Soil Boring and Surface/Subsurface Sampling (continued) | Cold stress | <ul style="list-style-type: none">• Workers should wear insulated clothing when temperatures drop below 40°F.• Drink warm beverages on breaks.• Remove wet clothing promptly.• Take breaks in warm areas.• Reduce work periods as necessary.• Layer work clothing. |
| | Access/egress hazards | <ul style="list-style-type: none">• Use qualified and trained bushhog operator.• Keep employees out of the bushhog work area.• Utilize good housekeeping practices.• Keep aisleways, pathways, and work areas free of obstruction.• Clean ice or snow off of walkways or work stations.• Use appropriate footwear for the task assigned. |
| | Heat rash | <ul style="list-style-type: none">• Keep the skin clean and dry.• Change perspiration-soaked clothing, as necessary.• Bathe at end of work shift or day.• Apply powder to affected area. |
| | Heat cramps | <ul style="list-style-type: none">• Drink plenty of cool fluids even when not thirsty.• Provide cool fluid for work crews.• Move victim to shaded, cool area. |
| | Heat exhaustion | <ul style="list-style-type: none">• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).• Set up work/rest periods.• Use the buddy system.• Allow workers time to acclimate.• Have ice packs available for use.• Take frequent breaks. |
| | Heat stroke | <ul style="list-style-type: none">• Evaluate possibility of night work.• Perform physiological monitoring on workers during breaks.• Wear body cooling devices. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 8 of 12)

| Activity | Potential Hazards | Recommended Controls |
|--|--|---|
| Soil Boring and Surface/Subsurface Sampling (continued) | Lightning strikes | <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people. |
| Moving and Shipping Collected Samples | Heavy lifting | <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift. |
| | Pinch points | <ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times! |
| | Cut hazards | <ul style="list-style-type: none"> • Wear adequate hand protection. Use care when handling glassware. |
| | Hazard communication | <ul style="list-style-type: none"> • Label all containers as to contents and associated hazards. |
| Material Storage | Flammable and combustible liquids | <ul style="list-style-type: none"> • Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded. |
| Disposal of Investigation-Derived Waste (IDW) (Forklift Operation) | Personnel injury, property damage, and/or equipment damage | <ul style="list-style-type: none"> • Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 9 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|---|--|
| Disposal of Investigation-Derived Waste (IDW) (Forklift Operation) (continued) | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none">Stop immediately at any sign of obstruction.Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.Only essential personnel will be in the work area.Real-time air monitoring will take place before and during sampling activities.All personnel will follow good hygiene practices.Proper decontamination procedures will be followed.All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">Use care when handling glassware.Wear adequate hand protection. |
| Heavy lifting | | <ul style="list-style-type: none">Use proper lifting techniques.Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift. |
| Slip, trip, and fall hazards | | <ul style="list-style-type: none">Good housekeeping shall be implemented.The work area shall be kept clean as feasible.Inspect the work area for slip, trip, and fall hazards. |
| Fueling | | <ul style="list-style-type: none">Only approved safety cans shall be used to store fuel.Do not refuel equipment while it is operating.Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. |
| Faulty or damaged equipment | | <ul style="list-style-type: none">Equipment shall be inspected before being placed into service and at the beginning of each shift.Preventive maintenance procedures recommended by the manufacturer shall be followed.A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance. |
| High-pressure water | | <ul style="list-style-type: none">Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate).One standby person shall be available within the vicinity of the pump during jetting operation.The work area shall be isolated and adequate barriers will be used to warn other site personnel. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 10 of 12)

| Activity | Potential Hazards | Recommended Controls |
|--|---|--|
| High-Pressure Water Jetting Operations (continued) | | |
| Unqualified operators | <ul style="list-style-type: none">Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning. | |
| Out of control equipment | <ul style="list-style-type: none">No machinery or equipment is permitted to run unattended.Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded. | |
| Noise | <ul style="list-style-type: none">Sound levels above 85 dBA mandates hearing protection by nearby site personnel. | |
| Activation during repairs | <ul style="list-style-type: none">All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. | |
| Pinch points | <ul style="list-style-type: none">Keep feet and hands clear of moving/suspended materials and equipment.Stay alert and clear of materials suspended. | |
| Falling objects | <ul style="list-style-type: none">Hard hats are required by site personnel.Stay alert and clear of material suspended overhead. | |
| Flying debris | <ul style="list-style-type: none">Impact-resistant safety glasses with side shields are required. | |
| Contact with potentially contaminated materials | <ul style="list-style-type: none">All site personnel will wear the appropriate PPE. | |
| Hydropunch sampling | Faulty or damaged equipment being utilized to perform work | <ul style="list-style-type: none">All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition.Equipment will be inspected before use and at the beginning of each shift.Faulty/unsafe equipment will be tagged and if possible locked out.Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 11 of 12)

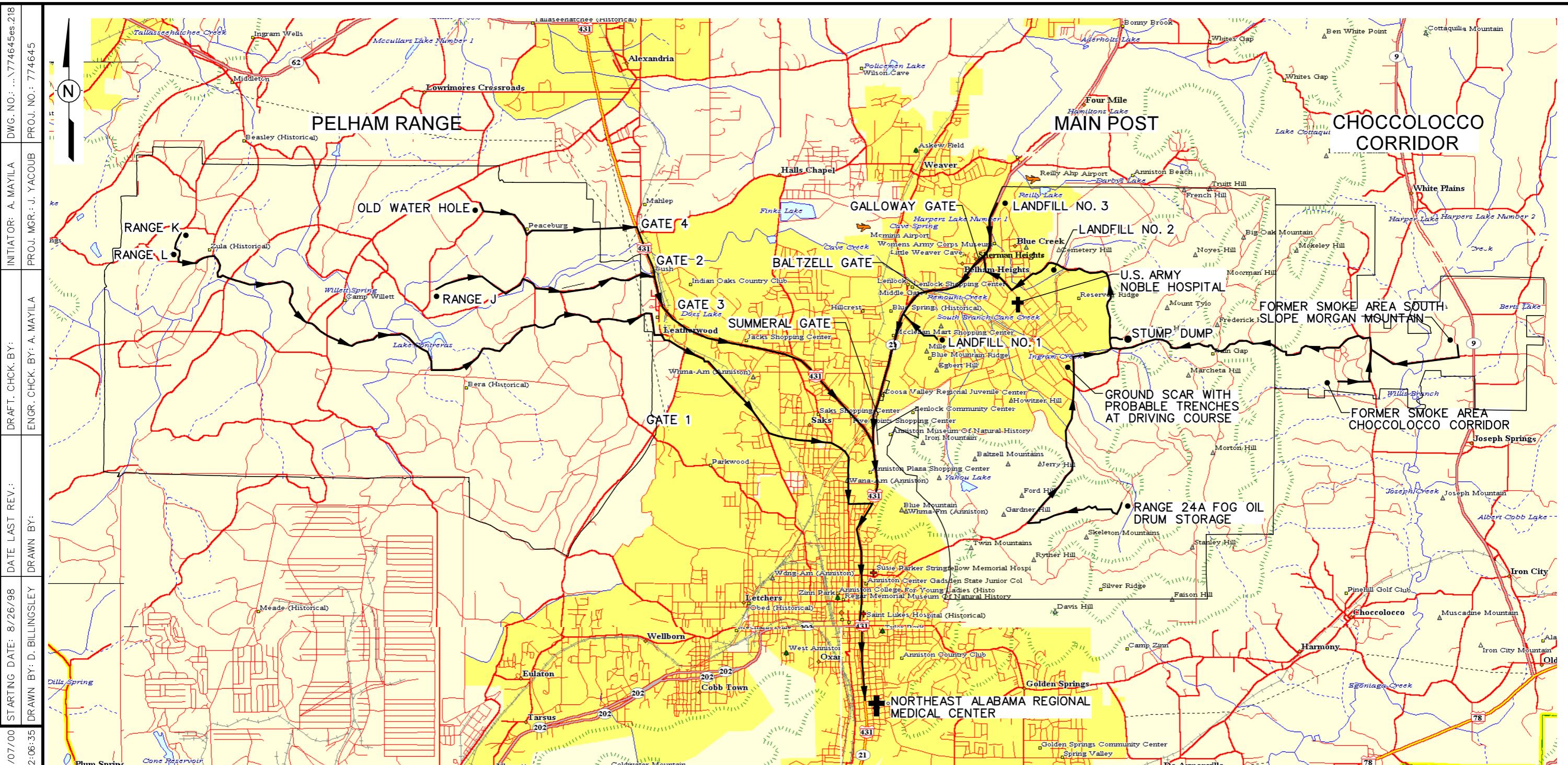
| Activity | Potential Hazards | Recommended Controls |
|---|--|---|
| Hydropunch Sampling (continued) | Uneven terrain, poor ground support, inadequate clearances, contact with utilities | <ul style="list-style-type: none">Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.All mobile equipment and areas in which they are operated shall be adequately illuminated.Whenever the equipment is parked, the parking brake shall be set.Equipment parked on inclines will have the wheels chocked.Inspect brakes and tire pressure on drill rig before staging for work.Obtain trenching/drilling permit prior to operation. |
| Inexperienced operator | | <ul style="list-style-type: none">Machinery and mechanized equipment shall be operated only by designated personnel.Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement. |
| Jacks/outriggers | | <ul style="list-style-type: none">Ensure proper footing and cribbing. |
| Falling objects | | <ul style="list-style-type: none">Remove unsecured tools and materials before raising or lowering the derrick.Stay alert and clear of materials suspended overhead. |
| Pinch points | | <ul style="list-style-type: none">Keep feet and hands clear of moving/suspended materials and equipment.Stay alert at all times! |
| Fire | | <ul style="list-style-type: none">Mechanized equipment shall be shut down prior to and during fueling operations.Have fire extinguishers inspected and readily available. |
| Fall hazards | | <ul style="list-style-type: none">Personnel are not allowed to work off of machinery or use them as ladders.Use fall protection when working above 6 feet. |
| Noise | | <ul style="list-style-type: none">Hearing protection is mandatory above 85 dBA. |
| Contact with rotating or reciprocating machine part | | <ul style="list-style-type: none">Use machine guards; use long-handled shovels to remove auger cuttings.Safe lockout procedures for maintenance work. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 1300, Parcels 148(7) and 16(7)
Fort McClellan, Calhoun County, Alabama

(Page 12 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---------------------------------|---|---|
| Hydropunch Sampling (continued) | Heavy Lifting | <ul style="list-style-type: none">• Use proper lifting techniques.• Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift. |
| | Slip, trip, and fall hazards | <ul style="list-style-type: none">• Practice good housekeeping; keep work area picked up and clean as feasible.• Continually inspect the work area for slip, trip, and fall hazards. |
| | Contact with potentially contaminated materials | <ul style="list-style-type: none">• Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized. |



LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- U.S. HIGHWAY
- ⊕ HOSPITALS
- INVESTIGATION SITES

FIGURE 1
HOSPITAL EMERGENCY ROUTES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

**Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

October 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Final
Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Former Motor Pool Area 600 at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

Date

Michael Henderson, CIH
Health & Safety Manager

Date

Jeff Tarr
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Former Motor Pool Area 600 at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

Date

Site-Specific Safety and Health Plan

Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Former Motor Pool Area 600 at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

Date

Fort McClellan Gate Hours

| | |
|---------------|---|
| Baltzell Gate | Baltzell Road. Open 24 hours daily, 7 days a week. |
|---------------|---|

Fort McClellan Project Emergency Contacts

| | |
|---|----------------|
| Fire Department (on post) | Ext. 17 |
| Fire Department (off post) | (205) 820-1117 |
| Ambulance (on post) | Ext. 12 |
| Ambulance (off post) | (205) 848-2315 |
| Military Police (on post) | Ext. 5-3821 |
| Military Police (off post) | (205) 848-5555 |
| Regional Medical Center | (205) 235-5121 |
| Chemical Agent Emergencies | Ext. 17 |
| UXO Emergencies | Ext. 17 |
| UXO Nonemergencies/Reporting Only (Ronald Levy) | (205) 848-3758 |
| National Response Center | (800) 424-8802 |
| Poison Control Center | (800) 462-0800 |
| EPA Region IV | (404) 562-8725 |
| Ronald Levy, Chief, FTMC Environmental Management | (205) 848-3758 |
| Ellis Pope, U.S. Army Corps of Engineers | (334) 690-3077 |
| Jeanne Yacoub, IT Project Manager | (423) 690-3211 |
| Michael Henderson, IT H&S Manager | (423) 690-3211 |
| Dr. Elaine Theriault, IT Occupational Physician | (800) 229-3674 |

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List of Acronyms ---

| | |
|------|--|
| BZ | breathing zone |
| FTMC | Fort McClellan |
| PPE | personal protective equipment |
| SHP | installation-wide safety and health plan |
| SSHP | site-specific safety and health plan |
| UST | underground storage tank |

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Former Motor Pool Area 600, Parcels 149(7) and 136(7) and compute the site relative risk.

Project Tasks

- Collect 11 surface soil samples.
- Collect 13 subsurface soil samples.
- Collect 1 sediment sample.
- Collect 1 depositional soil sample.
- Collect 1 surface water sample.
- Collect 7 groundwater samples.

Personnel Requirements. Up to ten employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP, Fort McClellan, Alabama.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

Former Motor Pool Area 600 has scrap metal and old golf carts stored on-site. It is believed that motor vehicle maintenance was conducted at this site in the past; however, this activity is not currently being conducted in this area. A records search has identified the possibility that one underground storage tank (UST) may be present in this area. The environmental baseline survey parcel description states that vehicle maintenance, a wash rack, and an oil/water separator are the basis of the site investigation at the site. This area is completely surrounded by a chain-link fence.

A site walkover revealed evidence of drums (drum saddle and lids) at the west boundary about two-thirds distance from the front gate on 18th Street. Evidence of excavation, either to install or to replace underground lines, extending from the rear of Building 698, was also noted. Evidence of excavation extended from the building to the area where evidence of drums was seen (northwest and west) and to the rear of the adjacent Building 699.

Parcel 136(7) is a former gas station at former Building 694, which is a location approximately located midway of the east parcel boundary. It was one of the standard post gas stations constructed in 1941 with a concrete foundation (9 by 21 feet) and corrugated steel walls. The building has been removed and the foundation is no longer there, but what appears to be an old pump island is still visible. Two fuel pumps are reported to be located on the island directly in front of the building, approximately 20 feet away. The USTs for this gas station are reported to be in front of the building. Closure reports are not on file at FTMC or Alabama Department of Environmental Management and may not have been required at the time of closure. The status of the USTs is unknown.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Former Motor Pool Area 600 site.

2.2 General Site Information

Location and Approximate Size of Site. Former Motor Pool Area 600 is located on an 8-acre rectangular parcel oriented NW-SE on 18th Street across from Building 350 (the Consolidated Maintenance Facility). It currently houses the Wildlife Management Office and the roads and grounds operations.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. Site elevation is approximately 820 feet with ground slope to the west, northwest.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 8)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---|----------------------|----------------------|--------------------------|--|---|--|-------------------------|---------------------|-----------------------------|
| Acetone [67-64-1] | 9.7 | 13-100 | Inh Ing Con | Irritated eyes, nose, and throat; headache, dizziness; dermatitis. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 750 ppm 750 ppm 250 ppm | 1,000 ppm 1,000 ppm | PEL TLV REL | 20,000 ppm |
| Arsenic and soluble Inorganic compounds (as As) [7740-38-2] | NA | NA | Inh Abs Ing Con | Ulceration of nasal septum, dermatitis, gastrointestinal disturbances; hyperpigmentation of the skin (carcinogenic); peripheral neuropathy, respiratory irritation. | Eye: Skin: Breath: Swallow: Irrigate immediately (15 min) Soap wash immediately Immediate medical attention | 0.01 mg/m ³ 0.2 mg/m ³ (Ca-29 CFR 1910.1018 Inorganic compounds) | 0.002 mg/m ³ | PEL TLV REL | Ca [100 mg/m ³] |
| Benzene [71-43-2] | 9.24 | 34-119 | Inh Abs Ing Con | Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue; anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm | 5 ppm C1 ppm (Ca) | PEL TLV REL | Ca [1,000 ppm] *OSHA |
| 1,2-Dichloroethane (ethylene dichloride) [107-06-02] | 11.05 | ? | Inh Abs Ing Con | Depressed central nervous system, nausea, vomiting, dermatitis, irritated eyes, corneal opacity. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 1 ppm 10 ppm 1 ppm | 2 ppm 2 ppm | PEL TLV REL | Ca [1,000] |
| 1,2-Dichloroethylene [540-59-0] | 9.65 | 17 | Inh Ing Con | Irritated eyes and respiratory system; depressed central nervous system. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 200 ppm 200 ppm 200 ppm | | PEL TLV REL | 4,000 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|--|----------------------|----------------------|--------------------|---|--|-------------------------------|-------------------------------|---------------------|---------------------------|
| Dichloromethane, see methylene chloride | | | | Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma. | Irrigate Immediately Water flush promptly Respiratory support Swallow: Immediate medical attention | 100 ppm 100 ppm 100 ppm | 125 ppm 125 ppm 125 ppm | PEL TLV REL | 2,000 ppm |
| Ethyl benzene [100-41-4] | 8.76 | 0.09-0.6 | Inh Ing Con | | | | | | |
| Fuel oil (diesel oil, medium) | ? | ? | Ing Inh Con | Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema, bronchopneumonia; excited, then depressed, central nervous system. | Irrigate promptly Soap wash Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention | | | PEL TLV REL | |
| Fuel Oil No. 1, see kerosene. [NA] | | | | | | | | PEL TLV REL | |
| Fuel Oil No. 2, see fuel oil. [NA] | | | | | | | | PEL TLV REL | |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---------------------------------------|----------------------|----------------------|--------------------|--|--|---|----------------------------|---------------------|---------------------------|
| Fuel Oils No. 4, 5, and 6 [NA] | ? | ? | Abs Con | Low toxicity; prolonged contact may produce systemic effects. | Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention | | | PEL TLV REL | |
| Kerosene | ? | ? | Inh Ing Con | Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakness; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia. | Eye: Irrigate immediately Skin: Soap wash promptly Respiratory support Immediate medical attention | 100 mg/m ³ | | PEL TLV REL | |
| Gasoline [8006-61-9] | ? | 0.3 | Inh Ing Con | Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic. | Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Respiratory support Immediate medical attention | 300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm) | 500 ppm 500 ppm | PEL TLV REL | ? |
| n-Hexane [110-54-3] | 10.18 | 65-248 | Inh Ing Con | Lightheadedness; nausea, headache; numbness of the extremities; muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness. | Eye: Irrigate immediately Skin: Soap wash immediately Respiratory support Immediate medical attention | | 50 ppm 50 ppm 50 ppm | PEL TLV REL | 5,000 ppm |
| Hydrogen chloride (hydrochloric acid) | 12.74 | 0.255-10.6 | Inh Ing Con | Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema. | Eye: Irrigate immediately Skin: Water flush immediately Respiratory support Immediate medical attention | | C5 ppm C5 ppm C5 ppm | PEL TLV REL | 100 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|--|----------------------|----------------------|--------------------------|---|--|------------------------------------|---|---------------------|---------------------------|
| Isopropyl alcohol (Isopropanol) [67-63-0] | 10.16 | 43-200 | Inh Ing Con | Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin. | Irrigate immediately Water flush Respiratory support Immediate medical attention | 400 ppm 400 ppm 400 ppm | 500 ppm 500 ppm 500 ppm | PEL TLV REL | 12,000 ppm |
| Lead [7439-92-1] | NA | NA | Inh Ing Con | Weak, Insomnia, facial pallor, constipation, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy. | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.05 mg/m 0.05 mg/m 0.1 mg/m | | PEL TLV REL | 100 mg/m |
| Methanol | 10.85 | 4.2-5960 | Inh Abs Ing Con | Irritated eyes, headache, drowsiness, light-headedness, nausea, vomiting, disturbance in vision, blindness. | Irrigate immediately Water flush promptly Fresh air Immediate medical attention | | 200 ppm (skin) 200 ppm (skin) 200 ppm | PEL TLV REL | 25,000 ppm |
| Methylene chloride (dichloromethane) [75-09-2] | 11.32 | ? | Inh Ing Con | Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin. | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 500 ppm 50 ppm | C1,000 ppm; C2,000 mg/m ³ (5 min In 2 hrs) | PEL TLV REL | Ca (5,000 ppm) |
| Methyl ethyl ketone [78-93-3] | 9.54 | 2-85 | Inh Ing Con | Irritated eyes and nose; headache, dizziness; vomiting. | Irrigate immediately Water flush promptly Fresh air Immediate medical attention | 200 ppm 200 ppm 200 ppm | 300 ppm 300 ppm 300 ppm | PEL TLV REL | 3,000 ppm |
| Motor oil [NA] | ? | ? | Inh Ing | Irritated eyes, skin, respiratory system, usually only a problem if misted or ingested. | Irrigate immediately (15 mins) Soap wash immediately Immediate medical attention | | | PEL TLV REL | |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA ^a | STEL ^d | Source* | IDLH (NIOSH) ^c |
|--|----------|----------------------|-------------------|--|--------------------------------------|---|---|-------------------------------|---------------------------|
| Naphtha, see petroleum distillate | | | | | | | | | |
| Nitric acid [7697-37-2] | 11.95 | 0.3-1 | Inh Ing Con | Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion. | Eye: Skin: Breath: Swallow: | Irrigate Immediately Water flush promptly Respiratory support Immediate medical attention | 2 ppm 2 ppm 2 ppm | 4 ppm 4 ppm 4 ppm | 100 ppm |
| Petroleum distillate (Naphtha) [8002-05-9] | ? | ? | Con Ing | Coughing, dyspnea, nausea, or vomiting. | | | 400 ppm | | PEL TLV REL |
| Petroleum hydrocarbons, see Stoddard solvent | | | | | | | | | |
| Phosgene (CG) | ? | ? | Inh Con | Irritated eyes, nose and upper respiratory tract; wheezing and difficulty in breathing; eye and skin burns; pulmonary edema. | Eye: Skin: Breath: Swallow: | Irrigate Immediately Soap wash immediately Respiratory support | 0.1 ppm 0.1 ppm 0.1 ppm | 15-minute ceiling: 0.2 ppm | PEL TLV REL |
| Portland cement | | | Inh | Fine gray powder that can be irritating if inhaled or in eyes. | Eye: Skin: Breath: Swallow: | Irrigate Immediately Soap wash immediately Respiratory support Immediate medical attention | 10 mg/m ³ 10 mg/m ³ / total dust 5 mg/m ³ respirable fraction | TLV PEL/REL | 2 ppm |
| Sodium hydroxide [1310-73-2] | NA | NA | Inh Ing Con | Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair. | Eye: Skin: Breath: Swallow: | Irrigate Immediately Water flush immediately Respiratory support Immediate medical attention | C2 mg/m ³ C2 mg/m ³ C2 mg/m ³ | PEL TLV REL | 250 mg/m ³ |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f | |
|---|----------------------|----------------------|--------------------------|---|--------------------------------------|---|---|---|---------------------------|--------------------------|
| Sulfuric acid [7664-93-9] | ? | 0.15 | Inh Ing Con | Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis. | Eye: Skin: Breath: Swallow: | Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | 1 mg/m ³ 1 mg/m ³ 1 mg/m ³ | 3 mg/m ³ | PEL TLV REL | 80 mg/m ³ |
| Stoddard Solvent | ? | ? | Inh Ing Con | Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash Respiratory support Immediate medical attention | 500 ppm 350 mg/m ³ | | PEL TLV REL | 20,000 mg/m ³ |
| Tetrachloroethylene (perchloroethylene) [127-18-4] | 9.32 | 47 | Inh Ing Con | Irritates eyes, nose, throat; nausea; flushed face, neck; vertigo, dizziness, incoordination; headache, sleepiness; skin redness; liver damage, suspected human carcinogen. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 25 ppm 50 ppm | 200 ppm minimize exposure (LOQ 0.4 ppm) | PEL TLV REL | Ca [500 ppm] |
| Toluene [108-88-3] | 8.82 | 0.16-37 | Inh Abs Ing Con | Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 ppm 50 ppm (skin) 100 ppm | 150 ppm 150 ppm | PEL TLV REL | 2,000 ppm |
| 1,1,1-Trichloroethane (methyl chloroform) [71-55-6] | 11.0 | 390 | Inh Ing Con | Headache, lassitude; central nervous system depression, poor equilibrium; irritated eyes; dermatitis; cardiac arrhythmia. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 350 ppm 350 ppm | 450 ppm 450 ppm C350 ppm | PEL TLV REL | 1,000 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA [°] | STEL ^a | Source* | IDLH (NIOSH) ^b |
|---|------------------------|----------------------|--------------------------|---|--------------------------------------|--|--|-------------------------------|--|
| Trichloroethylene, see Trichloroethylene [79-01-6] | | | | | | | | | |
| Trichloroethylene (TCE, trichloroethylene) [79-01-6] | 9.45 | 21.4 | Inh Ing Con | Headache, vertigo; visual disturbance, tremors, somnolence, nausea, vomiting; irritated eyes; dermatitis; cardiac arrhythmia, paresthesia. Carcinogenic. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 50 ppm 50 ppm 25 ppm | 200 ppm 200 ppm Ca | PEL TLV REL Ca [1,000 ppm] |
| 2,4,6-Trinitrotoluene (TNT) [118-96-7] | 10.59 | ? | Inh Abs Ing Con | Liver damage, jaundice; cyanosis; sneezing; coughing, sore throat; peripheral neuropathy, muscular pain; kidney damage; cataract; sensitive dermatitis; leukocytosis; anemia; cardiac irregularities. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.5 mg/m ³ (skin) 0.5 mg/m ³ (skin) 0.5 mg/m ³ (skin) | PEL TLV REL NE | |
| Xylene (o-, m-, and p-isomers) [1330-20-7; 95-47-6; 108-38-3; 106-42-3] | 8.56/ 8.56/ 8.44 | 1.1-20 | Inh Abs Ing Con | Dizziness, excitement, drowsiness, incoordination, staggering gait; Irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 ppm 100 ppm 100 ppm | 150 ppm 150 ppm 150 ppm | PEL TLV REL 1,000 ppm |

^aIP = Ionization potential (electron volts).

^bRoute = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.

[°]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

^aSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama**

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*PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

'IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a

respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. 1998).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

References:

- American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.
- Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," *Journal of Applied Toxicology*, 1983.
- Clayton, George D., Clayton, F. E., Party's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
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- Micromedex Toxbase Plus (R) System, 1992, Micromedex, Inc.
- National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.
- Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
- Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
- Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
- Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
- Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

| Task | Initial Level of PPE |
|--------------------|----------------------|
| Staging equipment | Level D |
| Collecting samples | Modified Level D* |

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

-
- Escape/egress air supply pack (where chemical-agents are suspected)
 - Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
 - Latex boot covers
 - Nitrile, heavy work, or latex gloves
 - Steel-toed safety boots
 - Safety glasses
 - Hard hat

- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from Former Motor Pool Area 600 operations are diesel fuels, benzene, ethyl benzene, toluene, xylene, and lead. Table 4-1 contains action levels for site monitoring at the Former Motor Pool Area 600.

Monitoring will be performed by the site safety and health officer during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the sampling location and BZs for combustible/flammable gas and oxygen levels that would necessitate evacuation of the work area. Table 4-2 contains the air monitoring frequency and location for site monitoring at Former Motor Pool Area 600.

Table 4-1
Action Levels
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

| Analyte | Action Level | Required Action ^a |
|------------------|---------------------------------|--|
| VOHs | ≥ 10 ppm above background in BZ | Stop work, evacuate work area, upgrade to Level B. |
| Benzene | ≥ 5 ppm in BZ | Stop work, evacuate work area, upgrade to Level B. |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

When in Level D Modified/D PPE

| Analyte | Action Level | Required Action ^b |
|------------------|--------------------------------|---|
| VOHs | ≥ 5 ppm above background in BZ | Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE. |
| Benzene | 1 ppm in BZ | Upgrade to Level C PPE. |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

Table 4-1
Action Levels
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

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When in Support Zone

| Analyte | Action Level | Required Action |
|---------|--------------------------------|---|
| VOHs | ≥ 1 ppm above background in BZ | Evacuate support zone and re-establish perimeter of exclusion zone. |

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2
Air Monitoring Frequency and Location
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

| Work Activity | Instrument | Frequency | Location |
|---|--|------------------------------|----------------------------------|
| Staging equipment | OV Monitor | Initially for area | Breathing zone (BZ) of employees |
| Sampling (groundwater, surface water, sediment, and soil) | OV Monitor LEL/O ₂ Monitor | Continuously Continuously | BZ of employees Support zone |

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil, sediment, groundwater, and surface water sampling.

All injuries and illnesses must be immediately reported to the site manager or the site safety and health officer, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---------------------------------|------------------------------|--|
| Staging equipment | Slip, trip, and fall hazards | <ul style="list-style-type: none">Determine best access route before transporting equipment.Practice good housekeeping; keep work area picked up and clean as feasible.Continually inspect the work area for slip, trip, and fall hazards.Look before you step; ensure safe and secure footing. |
| Heavy lifting | | <ul style="list-style-type: none">Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment. |
| Falling objects | | <ul style="list-style-type: none">Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots. |
| Flying debris, dirt, dust, etc. | | <ul style="list-style-type: none">Wear safety glasses/goggles; ensure that eye wash is in proper working condition. |
| Pinch points | | <ul style="list-style-type: none">Keep hands, fingers, and feet clear of moving/suspended materials and equipment.Beware of contact points.Stay alert at all times! |
| Cuts/bruises | | <ul style="list-style-type: none">Use cotton or leather work gloves for material handling. |
| Bees, spiders, and snakes | | <ul style="list-style-type: none">Inspect work area carefully and avoid placing hands and feet into concealed areas. |
| Ticks | | <ul style="list-style-type: none">Wear light colored clothing (can see ticks better).Mow vegetation and small brush areas.Wear insect repellent.Wear long sleeves and long pants.Visually check oneself promptly and frequently after exiting the work area. |
| Fire | | <ul style="list-style-type: none">Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. |
| Hazard communication | | <ul style="list-style-type: none">Label all containers as to contents and dispose of properly.Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 12)

| Activity | Potential Hazards | Recommended Controls |
|--------------------------------------|---|----------------------|
| Staging equipment (continued) | | |
| Noise | • Sound levels above 85 decibels (dBA) mandates hearing protection. | |
| Lighting | • Adequate lighting will be provided to ensure a safe working environment. | |
| Cold stress | • Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing. | |
| Poison ivy/oak/sumac | • Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water. | |
| Heat rash | • Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area. | |
| Heat cramps | • Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area. | |
| Heat exhaustion | • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the "buddy system." • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks. | |
| Heat stroke | • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices. | |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 3 of 12)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|--|--|
| Staging equipment (continued) | Contact with moving equipment/vehicles | <ul style="list-style-type: none">• Work area will be barricaded/demarcated.• Equipment will be laid out in an area free of traffic flow.• Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.• Barricars shall be used to protect workers from vehicular traffic.• Barricars shall be used to guard excavations adjacent to streets or roadways.• Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.• Heavy equipment shall have backup alarms. |
| Forklift operations | | <ul style="list-style-type: none">• Use qualified and trained forklift operators.• The operator shall not exceed the load capacity rating for the forklift.• The load capacity shall be clearly visible on the forklift.• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Portable electric tools | | <ul style="list-style-type: none">• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.• Portable electric tools and all cord and plug connected equipment shall be protected by a ground-fault circuit interrupter device.• Electrical tools shall be inspected daily prior to use. |
| Extension cords | | <ul style="list-style-type: none">• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.• Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.• Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).• Cords shall be designed for hard duty.• Cords shall be inspected daily. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 4 of 12)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|-------------------------------------|--|
| Staging equipment (continued) | Lightning strikes | <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people. |
| Thunderstorms, tornadoes | Slip, trip, and fall hazards | <ul style="list-style-type: none"> • Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado. |
| Surveying | | <ul style="list-style-type: none"> • Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials. |
| Traffic accidents | | <ul style="list-style-type: none"> • Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion. |
| Wildlife hazards | | <ul style="list-style-type: none"> • Workers should be cautious when driving through the site in order to avoid encounters with passing animals. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 5 of 12)

| Activity | Potential Hazards | Recommended Controls |
|-----------------------|--|---|
| Surveying (continued) | | |
| | Biological hazards | <ul style="list-style-type: none"> • Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads). |
| | Ticks | <ul style="list-style-type: none"> • Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellent. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area. |
| | Poison ivy/oak sumac | <ul style="list-style-type: none"> • Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water. |
| | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none"> • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| | Cut hazards | <ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection. |
| | Hazard communication | <ul style="list-style-type: none"> • MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents. |
| | Strains/sprains | <ul style="list-style-type: none"> • Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 6 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|---|--|
| Groundwater sampling (continued) | | |
| Spills/residual materials | | <ul style="list-style-type: none">Absorbent material and containers will be kept available where leaks or spills may occur. |
| Lighting | | <ul style="list-style-type: none">Adequate lighting will be provided to ensure a safe working environment. |
| Unattended worker | | <ul style="list-style-type: none">Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities. |
| Soil boring and surface/subsurface sampling | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none">Stop immediately at any sign of obstruction.Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.Only essential personnel will be in the work area.Real-time air monitoring will take place before and during sampling activities.All personnel will follow good hygiene practices.Proper decontamination procedures will be followed.All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">Use care when handling glassware.Wear adequate hand protection. |
| Slip, trip, and fall hazards | | <ul style="list-style-type: none">Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field.Whenever possible, avoid routing cords and hoses across walking pathways.Flag or cover inconspicuous holes to protect against falls. |
| Bees, spiders, and snakes | | <ul style="list-style-type: none">Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas.Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms. |
| Poison ivy/oak/sumac | | <ul style="list-style-type: none">Avoid plant areas if possible.Wear long sleeves and long pants.Promptly wash clothing that has contacted poisonous plants.Wash affected areas immediately with soap and water. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 7 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|-----------------------|---|
| Soil boring and surface/subsurface sampling (continued) | Cold stress | <ul style="list-style-type: none">• Workers should wear insulated clothing when temperatures drop below 40°F.• Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.• Remove wet clothing promptly.• Take breaks in warm areas.• Reduce work periods as necessary.• Layer work clothing. |
| | Access/egress hazards | <ul style="list-style-type: none">• Use qualified and trained bushhog operator.• Keep employees out of the bushhog work area.• Utilize good housekeeping practices.• Keep aisleways, pathways, and work areas free of obstruction.• Clean ice or snow off of walkways or work stations.• Use appropriate footwear for the task assigned. |
| | Heat rash | <ul style="list-style-type: none">• Keep the skin clean and dry.• Change perspiration-soaked clothing, as necessary.• Bathe at end of work shift or day.• Apply powder to affected area. |
| | Heat cramps | <ul style="list-style-type: none">• Drink plenty of cool fluids even when not thirsty.• Provide cool fluid for work crews.• Move victim to shaded, cool area. |
| | Heat exhaustion | <ul style="list-style-type: none">• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).• Set up work/rest periods.• Use the buddy system.• Allow workers time to acclimate.• Have ice packs available for use.• Take frequent breaks. |
| | Heat stroke | <ul style="list-style-type: none">• Evaluate possibility of night work.• Perform physiological monitoring on workers during breaks.• Wear body cooling devices. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 8 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|--------------------------|---|
| Soil boring and surface/subsurface sampling (continued) | Lightning strikes | <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people. |
| Surface water/sediment sampling | Drowning | <ul style="list-style-type: none"> • Personal flotation devices (PFD) will be provided and worn by workers over or near water where the danger of drowning exists. • PFDs shall be inspected prior to and after each use. • Detective PFDs will be tagged and removed from service. • Ring buoys with at least 90 feet of line shall be provided and readily available at locations where employees are working over or adjacent to water. • Use the "buddy system." • Personnel trained in launching and operating the skiff shall be readily available during work hours. |
| Moving and shipping collected samples | Heavy lifting | <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. |
| Pinch points | | <ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times! |
| Cut hazards | | <ul style="list-style-type: none"> • Wear adequate hand protection. Use care when handling glassware. |
| Hazard communication | | <ul style="list-style-type: none"> • Label all containers as to contents and associated hazards. |
| Heavy lifting | | <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 9 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|--|--|
| Material storage | Flammable and combustible liquids | <ul style="list-style-type: none">Store in NO SMOKING AREA.Fire extinguisher readily available.Transfer only when properly grounded and bonded. |
| Disposal of investigation-derived waste (IDW) (Forklift Operation) | Personnel injury, property damage, and/or equipment damage | <ul style="list-style-type: none">Use qualified and trained forklift operators.The operator shall not exceed the load capacity rating for the forklift.The load capacity shall be clearly visible on the forklift.Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Cross-contamination and contact with potentially contaminated materials | | <ul style="list-style-type: none">Stop immediately at any sign of obstruction.Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.Only essential personnel will be in the work area.Real-time air monitoring will take place before and during sampling activities.All personnel will follow good hygiene practices.Proper decontamination procedures will be followed.All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">Use care when handling glassware.Wear adequate hand protection. |
| Heavy lifting | | <ul style="list-style-type: none">Use proper lifting techniques.Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. |
| High-pressure water jetting operations | Slip, trip, and fall hazards | <ul style="list-style-type: none">Good housekeeping shall be implemented.The work area shall be kept clean as feasible.Inspect the work area for slip, trip, and fall hazards. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 10 of 12)

| Activity | Potential Hazards | Recommended Controls |
|--|---|----------------------|
| High-pressure water jetting operations (continued) | Fueling <ul style="list-style-type: none">• Only approved safety cans shall be used to store fuel.• Do not refuel equipment while it is operating.• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. | |
| | Faulty or damaged equipment <ul style="list-style-type: none">• Equipment shall be inspected before being placed into service and at the beginning of each shift.• Preventive maintenance procedures recommended by the manufacturer shall be followed.• A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance. | |
| | High-pressure water <ul style="list-style-type: none">• Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate).• One standby person shall be available within the vicinity of the pump during jetting operation.• The work area shall be isolated and adequate barriers will be used to warn other site personnel. | |
| | Unqualified operators <ul style="list-style-type: none">• Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning. | |
| | Out of control equipment <ul style="list-style-type: none">• No machinery or equipment is permitted to run unattended.• Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded. | |
| | Noise <ul style="list-style-type: none">• Sound levels above 85 dBA mandates hearing protection by nearby site personnel. | |
| | Activation during repairs <ul style="list-style-type: none">• All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. | |
| | Pinch points <ul style="list-style-type: none">• Keep feet and hands clear of moving/suspended materials and equipment.• Stay alert and clear of materials suspended. | |
| | Falling objects <ul style="list-style-type: none">• Hard hats are required by site personnel.• Stay alert and clear of material suspended overhead. | |
| | Flying debris <ul style="list-style-type: none">• Impact-resistant safety glasses with side shields are required. | |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 11 of 12)

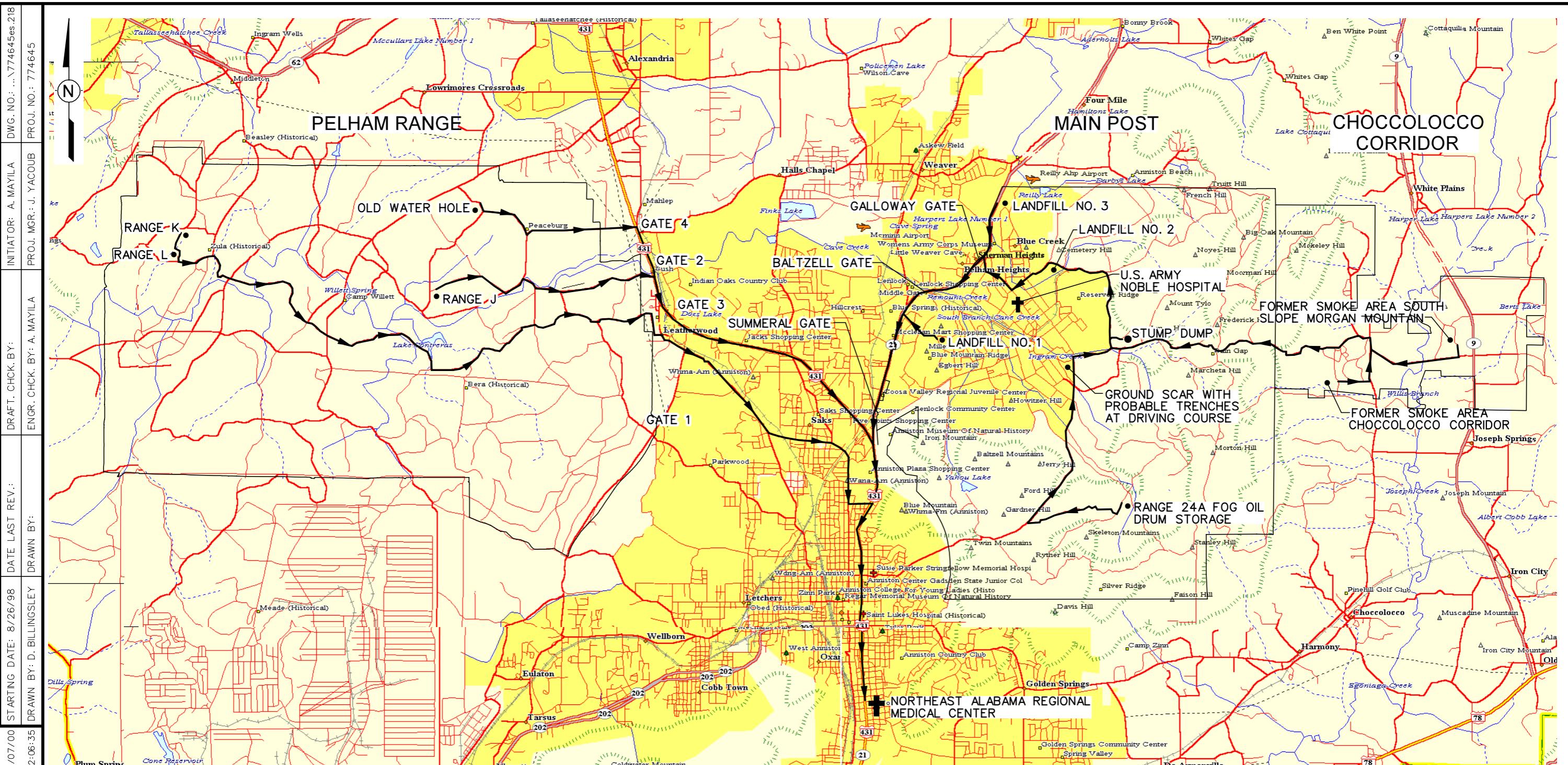
| Activity | Potential Hazards | Recommended Controls |
|--|--|--|
| High-pressure water jetting operations (continued) | Contact with potentially contaminated materials | <ul style="list-style-type: none"> All site personnel will wear the appropriate PPE. |
| Hydropunch sampling | Faulty or damaged equipment being utilized to perform work | <ul style="list-style-type: none"> All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition. Equipment will be inspected before use and at the beginning of each shift. Faulty/unsafe equipment will be tagged and if possible locked out. Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so. |
| Uneven terrain, poor ground support, inadequate clearances, contact with utilities | | <ul style="list-style-type: none"> Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. All mobile equipment and areas in which they are operated shall be adequately illuminated. Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines will have the wheels chocked. Inspect brakes and tire pressure on drill rig before staging for work. Obtain trenching/drilling permit prior to operation. |
| Inexperienced operator | | <ul style="list-style-type: none"> Machinery and mechanized equipment shall be operated only by designated personnel. Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement. |
| Jacks/outriggers | | <ul style="list-style-type: none"> Ensure proper footling and cribbing. |
| Falling objects | | <ul style="list-style-type: none"> Remove unsecured tools and materials before raising or lowering the derrick. Stay alert and clear of materials suspended overhead. |
| Pinch points | | <ul style="list-style-type: none"> Keep feet and hands clear of moving/suspended materials and equipment. Stay alert at all times! |
| Fire | | <ul style="list-style-type: none"> Mechanized equipment shall be shut down prior to and during fueling operations. Have fire extinguishers inspected and readily available. |

Table 5-1

Activity Hazard Analysis
Former Motor Pool Area 600, Parcels 149(7) and 136(7)
Fort McClellan, Calhoun County, Alabama

(Page 12 of 12)

| Activity | Potential Hazards | Recommended Controls |
|---|---|----------------------|
| Hydropunch sampling (continued) | | |
| Fall hazards | <ul style="list-style-type: none">• Personnel are not allowed to work off of machinery or use them as ladders.• Use fall protection when working above 6 feet. | |
| Noise | <ul style="list-style-type: none">• Hearing protection is mandatory above 85 dBA. | |
| Contact with rotating or reciprocating machine part | <ul style="list-style-type: none">• Use machine guards; use long-handled shovels to remove auger cuttings.• Safe lockout procedures for maintenance work. | |
| Heavy lifting | <ul style="list-style-type: none">• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. | |
| Slip, trip, and fall hazards | <ul style="list-style-type: none">• Practice good housekeeping; keep work area picked up and clean as feasible.• Continually inspect the work area for slip, trip, and fall hazards. | |
| Contact with potentially contaminated materials | <ul style="list-style-type: none">• Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized. | |



LEGEND

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
 - 431 U.S. HIGHWAY
 - ✚ HOSPITALS
 - INVESTIGATION SITES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

FIGURE 1 HOSPITAL EMERGENCY ROUTES

**Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

October 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Final
Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Motor Pool Area 800 at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT procedures.

Jeanne Yacoub, PE
Project Manager

Date

Michael Henderson, CIH
Health & Safety Manager

Date

Jeff Tarr
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Motor Pool Area 800 at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

Date

Safety and Health Plan Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Motor Pool Area 800 at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

Date

Fort McClellan Gate Hours

| | |
|---------------|---|
| Baltzell Gate | Baltzell Road. Open 24 hours daily, 7 days a week. |
|---------------|---|

Fort McClellan Project Emergency Contacts

| | |
|--|----------------|
| Fire Department (on post) | Ext. 17 |
| Fire Department (off post) | (205) 820-1117 |
| Ambulance (on post) | Ext. 12 |
| Ambulance (off post) | (205) 848-2315 |
| Military Police (on post) | Ext. 5-3821 |
| Military Police (off post)..... | (205) 848-5555 |
| Regional Medical Center | (205) 235-5121 |
| Chemical Agent Emergencies | Ext. 17 |
| UXO Emergencies | Ext. 17 |
| UXO Nonemergencies/Reporting Only (Ronald Levy) | (205) 848-3758 |
| National Response Center..... | (800) 424-8802 |
| Poison Control Center..... | (800) 462-0800 |
| EPA Region IV | (404) 562-8725 |
| Ronald Levy, Chief, FTMC Environmental Management..... | (205) 848-3758 |
| Ellis Pope, U.S. Army Corps of Engineers | (334) 690-3077 |
| Jeanne Yacoub, IT Project Manager | (423) 690-3211 |
| Michael Henderson, IT H&S Manager | (423) 690-3211 |
| Dr. Elaine Theriault, IT Occupational Physician | (800) 229-3674 |

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List of Acronyms ---

| | |
|-------|--|
| FTMC | Fort McClellan |
| PPE | personal protective equipment |
| SHP | installation-wide safety and health plan |
| SSHO | site safety and health officer |
| SSHSP | site-specific safety and health plan |

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7).

Project Tasks

- Collect 15 soil samples.
- Collect 12 subsurface soil samples.
- Collect 5 sediment samples.
- Collect 5 surface water samples.
- Collect 13 groundwater samples.
- Collect 1 depositional soil sample.

Personnel Requirements. Up to 10 employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP).

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The Activity Hazard Analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The Activity Hazard Analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

A wash rack, an oil/water separator, and loading ramp are currently located on the Motor Pool Area 800 site. Two underground storage tanks and one aboveground fuel storage area are also located on the site.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at Motor Pool Area 800, Parcel 164(7).

2.2 General Site Information

Location of Site. Motor Pool Area 800, Parcel 164(7) is located on Third Avenue near 21st Street.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. The Motor Pool Area 800 is at a site elevation of 800 feet, sloping down to the west, southwest.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

Table 2-1

Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 8)

| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH ^q (NIOSH) ^f |
|---|-------------|----------------------------|--------------------------|--|---|--|-------------------------------|---------------------|---|
| Acetone [67-64-1] | 9.7 | 13-100 | Inh Ing Con | Irritated eyes, nose, and throat; headache, dizziness; dermatitis. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 750 ppm 750 ppm 250 ppm | 1,000 ppm 1,000 ppm | PEL TLV REL | 20,000 ppm |
| Benzene [71-43-2] | 9.24 | 34-119 | Inh Abs Ing Con | Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm | 5 ppm C1 ppm (ca) | PEL TLV REL | Ca [1,000 ppm] ^g OSHA |
| Dichloromethane, see methylene chloride | | | | | | | | | |
| Ethyl benzene [100-41-4] | 8.76 | 0.09-0.6 | Inh Ing Con | Irritates eyes, mucous membranes; headache, dermatitis; narcosis, coma. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Respiratory support Immediate medical attention | 100 ppm 100 ppm 100 ppm | 125 ppm 125 ppm 125 ppm | PEL TLV REL | 2,000 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TVA ^c | STEL ^d | Source ^e | IDLHq (NIOSH) ^f |
|--|-------------|----------------------------|--------------------|---|---|------------------|-------------------|---------------------|-------------------------------|
| Fuel oil (diesel oil, medium) | ? | ? | Ing Inh Con | Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system. | Eye: Irrigate promptly Skin: Soap wash Respiratory support Breath: Immediate medical attention Swallow: Aspiration: Immediate medical attention | | | PEL TLV REL | |
| Fuel Oil No. 1, see kerosene. [NA] | | | | | | | | PEL TLV REL | |
| Fuel Oil No. 2, see fuel oil. [NA] | | | | | | | | PEL TLV REL | |
| Fuel Oils No. 4, 5, and 6 [NA] | ? | ? | Abs Con | Low toxicity; prolonged contact may produce systemic effects. | Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention | | | PEL TLV REL | |

Table 2-1

Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA* | STEL* | Source* | IDLH ^q (NIOSH)* |
|---|-------------|----------------------------|-------------------|--|--|---|----------------------------|-------------------|-------------------------------|
| Kerosene | ? | ? | Inh Ing Con | Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakness; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 mg/m ³ | | PEL TLV REL | |
| Gasoline [8006-61-9] | ? | 0.3 | Inh Ing Con | Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic. | Eye: Skin: Breath: Swallow: Irrigate immediately (15 min) Soap wash promptly Respiratory support Immediate medical attention | 300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm) | 500 ppm 500 ppm | PEL TLV REL | ? |
| n-Hexane [110-54-3] | 10.18 | 65-248 | Inh Ing Con | Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | | 50 ppm 50 ppm 50 ppm | PEL TLV REL | 5,000 ppm |
| Hydrogen chloride (hydrochloric acid) [74-90-8] | 12.74 | 0.255-10.6 | Inh Ing Con | Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; In animals; laryngeal spasm; pulmonary edema. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | | C5 ppm C5 ppm C5 ppm | PEL TLV REL | 100 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA* | STEL* | Source* | IDLH ^q (NIOSH)* |
|--|-------------|----------------------------|--------------------------|--|--|-------------------------------------|---|-------------------|-------------------------------|
| Isopropyl alcohol (isopropanol) [67-63-0] | 10.16 | 43-200 | Inh Ing Con | Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush Respiratory support Immediate medical attention | 400 ppm 400 ppm 400 ppm | 500 ppm 500 ppm 500 ppm | PEL TLV REL | 12,000 ppm |
| Lead [7439-92-1] | NA | NA | Inh Ing Con | Weak, insomnia, facial pallor, constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.05 mg/m 0.05 mg/m 0.1 mg/mf | | PEL TLV REL | |
| Methanol | 10.85 | 4.2-5960 | Inh Abs Ing Con | Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | | 200 ppm (skin) 200 ppm (skin) 200 ppm | PEL TLV REL | 25,000 ppm |
| Methylene chloride (dichloromethane) [75-09-2] | 11.32 | ? | Inh Ing Con | Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 500 ppm 50 ppm | C1,000 ppm; C2,000 mg/m ³ (5 min in 2 hrs) | PEL TLV REL | Ca (5,000 ppm) |
| Methyl ethyl ketone [78-93-3] | 9.54 | 2-85 | Inh Ing Con | Irritated eyes and nose; headache, dizziness; vomiting. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | 200 ppm 200 ppm 200 ppm | 300 ppm 300 ppm 300 ppm | PEL TLV REL | 3,000 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA* | STEL* | Source* | IDLH ^q (NIOSH)* |
|--|-------------|----------------------------|-------------------|---|---|--|-------------------------|-------------------|-------------------------------|
| Motor oil [NA] | ? | ? | Inh Ing | Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested. | Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention | | | PEL TLV REL | |
| Naphtha, see petroleum distillate | | | | | | | | | |
| Nitric acid [7697-37-2] | 11.95 | 0.3-1 | Inh Ing Con | Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion. | Eye: Irrigate immediately Water flush promptly Skin: Respiratory support Breath: Immediate medical attention | 2 ppm 2 ppm 2 ppm | 4 ppm 4 ppm 4 ppm | PEL TLV REL | 100 ppm |
| Petroleum distillate (Naphtha) [8002-05-9] | ? | ? | Con Ing Inh | Irritated eyes, nose, throat; dizziness, headache, nausea or vomiting, chemical pneumonia.. | Eye: Irrigate immediately Soap wash immediately Skin: Respiratory support Breath: Immediate medical attention | 500 ppm 500 ppm 350 mg/m ³ | 1800 mg/m ³ | PEL TLV REL | 1100 ppm (LEL) |
| Petroleum hydrocarbons, see Stoddard solvent | | | | | | | | | |
| Portland cement | | | Inh | Fine gray powder that can be irritating if inhaled or in eyes. | Eye: Irrigate immediately Skin: Wash immediately Breath: Respiratory support Swallow: Immediate medical attention | 10 mg/m ³ 10 mg/m ³ /total dust 5 mg/m ³ respirable fraction | TLV PEL/REL | | |

Table 2-1

Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA* | STEL* | Source* | IDLH ^q (NIOSH)* |
|---------------------------------|-------------|----------------------------|--------------------------|--|--------------------------------------|---|--|-------------------|-------------------------------|
| Sodium hydroxide [1310-73-2] | NA | NA | Inh Ing Con | Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair. | Eye: Skin: Breath: Swallow: | Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | C2 mg/m ³ C2 mg/m ³ C2 mg/m ³ | PEL TLV REL | 250 mg/m ³ |
| Sulfuric acid [7664-93-9] | ? | 0.15 | Inh Ing Con | Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis. | Eye: Skin: Breath: Swallow: | Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | 1 mg/m ³ 1 mg/m ³ 1 mg/m ³ | PEL TLV REL | 80 mg/m ³ |
| Stoddard Solvent | ? | ? | Inh Ing Con | Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash immediately respiratory support Immediate medical attention | 500 ppm 350 mg/m ³ | PEL TLV REL | 20,000 mg/m ³ |
| Toluene [108-88-3] | 8.82 | 0.16-37 | Inh Abs Ing Con | Fatigue, weakness; con- fusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 100 ppm 50 ppm (skin) 100 ppm | PEL TLV REL | 150 ppm 150 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama

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| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA* | STEL* | Source* | IDLH ^q (NIOSH) ^r |
|---|------------------------|----------------------------|--------------------------|---|---|-------------------------------|-------------------------------|-------------------|---|
| Xylene (o-, m-, and p-isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3] | 8.56/ 8.56/ 8.44 | 1.1-20 | Inh Abs Ing Con | Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dizziness. | Irrigate immediately Skin: Breath: Swallow: attention | 100 ppm 100 ppm 100 ppm | 150 ppm 150 ppm 150 ppm | PEL TLV REL | 1,000 ppm |

*IP = Ionization potential (electron volts).

*Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
 *TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.*STEL = Short-term TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
 *PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

*TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.

*REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

*IDLH (NIOSH)—immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a

respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 1998).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

Table 2-1

**Toxicological and Physical Properties of Chemicals
Motor Pool Area 800, Parcels 164(7), 11(7), 68(7), and 12(7)
Fort McClellan, Calhoun County, Alabama**

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References:

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- National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.
- Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
- Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
- Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
- Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
- Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. A completed description of Level D, Modified Level D, and Level C PPE is also provided.

| Task | Initial Level of PPE |
|--------------------|----------------------|
| Staging equipment | Level D |
| Collecting samples | Modified Level D* |

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated).
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from the Motor Pool Area 800 operations are diesel, benzene, ethyl benzene, xylene, and lead. Table 4-1 contains action levels for site monitoring at the Motor Pool Area 800 site.

Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the sampling location and BZs for combustible/flammable gas and oxygen levels that would necessitate evacuation of the work area. Table 4-2 contains the air monitoring frequency and location for site monitoring at Motor Pool Area 800.

Table 4-1
Action Levels
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

| Analyte | Action Level | Required Action ^a |
|------------------|---------------------------------|--|
| VOHs | ≥ 10 ppm above background in BZ | Stop work, evacuate work area, upgrade to Level B |
| Benzene | ≥ 5 ppm in BZ | Stop work, evacuate work area, upgrade to Level B |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations Stop work, evacuate work area |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area Continue operations, monitor for VOCs |

When in Level D Modified/D PPE

| | | |
|------------------|--------------------------------|---|
| | | |
| VOHs | ≥ 5 ppm above background in BZ | Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE. |
| Benzene | ≥ 1 ppm in BZ | Upgrade to Level C PPE. |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations Stop work, evacuate work area |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area Continue operations, monitor for VOCs |

Table 4-1
Action Levels
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

When in Support Zone

| Analyte | Action Level | Required Action |
|---------|--------------------------------|---|
| VOHs | ≥ 1 ppm above background in BZ | Evacuate support zone and re-establish perimeter of exclusion zone. |

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2
Air Monitoring Frequency and Location
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama

| Work Activity | Instrument | Frequency | Location |
|---|---|------------------------|--|
| Staging equipment | OV Monitor | Initially for area | Breathing zone (BZ) of employees BZ of employees Support zone |
| Sampling (groundwater, surface water, sediment, and soil) | OV Monitor LEL/O ₂ Monitor | Initially for location | |

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil, sediment, groundwater, and surface water sampling.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---------------------------------|------------------------------|---|
| Staging equipment | Slip, trip, and fall hazards | <ul style="list-style-type: none"> Determine best access route before transporting equipment. Practice good housekeeping; keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards. Look before you step; ensure safe and secure footing. |
| Heavy lifting | | <ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment. |
| Falling objects | | <ul style="list-style-type: none"> Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots. |
| Flying debris, dirt, dust, etc. | | <ul style="list-style-type: none"> Wear safety glasses/goggles; ensure that eye wash is in proper working condition. |
| Pinch points | | <ul style="list-style-type: none"> Keep hands, fingers, and feet clear of moving/suspended materials and equipment. Beware of contact points. Stay alert at all times! |
| Cuts/bruises | | <ul style="list-style-type: none"> Use cotton or leather work gloves for material handling. |
| Bees, spiders, and snakes | | <ul style="list-style-type: none"> Inspect work area carefully and avoid placing hands and feet into concealed areas. |
| Ticks | | <ul style="list-style-type: none"> Wear light colored clothing (can see ticks better). Mow vegetated and small brush areas. Wear insect repellent. Wear long sleeves and long pants. Visually check oneself promptly and frequently after exiting the work area. |
| Fire | | <ul style="list-style-type: none"> Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. |
| Hazard communication | | <ul style="list-style-type: none"> Label all containers as to contents and dispose of properly. Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 13)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|-------------------|---|
| Staging equipment (continued) | | |
| Noise | | <ul style="list-style-type: none">Sound levels above 85 decibels (dBA) mandates hearing protection. |
| Lighting | | <ul style="list-style-type: none">Adequate lighting will be provided to ensure a safe working environment. |
| Cold stress | | <ul style="list-style-type: none">Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F).Drink warm beverages on breaks.Remove wet clothing promptly.Take breaks in warm areas.Reduce work periods as necessary.Layer work clothing. |
| Poison ivy/oak/sumac | | <ul style="list-style-type: none">Avoid plant areas if possible.Wear long sleeves and long pants.Promptly wash clothing that has contacted poisonous plants.Wash affected areas immediately with soap and water. |
| Heat rash | | <ul style="list-style-type: none">Keep the skin clean and dry.Change perspiration-soaked clothing, as necessary.Bathe at end of work shift or day.Apply powder to affected area. |
| Heat cramps | | <ul style="list-style-type: none">Drink plenty of cool fluids even when not thirsty.Provide cool fluid for work crews.Move victim to shaded, cool area. |
| Heat exhaustion | | <ul style="list-style-type: none">Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature)Set up work/rest periods.Use the "buddy system."Allow workers time to acclimate.Have ice packs available for use.Take frequent breaks. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

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| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|---|--|
| Staging equipment (continued) | <p>Heat stroke</p> <p>Contact with moving equipment/vehicles</p> | <ul style="list-style-type: none">Evaluate possibility of night work.Perform physiological monitoring on workers during breaks.Wear body cooling devices. <ul style="list-style-type: none">Work area will be barricaded/demarcated.Equipment will be laid out in an area free of traffic flow.Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.Barriers shall be used to protect workers from vehicular traffic.Barriers shall be used to guard excavations adjacent to streets or roadways.Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.Heavy equipment shall have backup alarms. |
| Forklift operations | | <ul style="list-style-type: none">Use qualified and trained forklift operators.The operator shall not exceed the load capacity rating for the forklift.The load capacity shall be clearly visible on the forklift.Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Portable electric tools | | <ul style="list-style-type: none">Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device.Electrical tools shall be inspected daily prior to use. |
| Extension cords | | <ul style="list-style-type: none">Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).Cords shall be designed for hard duty.Cords shall be inspected daily. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 13)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|--------------------------|---|
| Staging equipment (continued) | Lightning strikes | <ul style="list-style-type: none">• Whenever possible, halt activities and take cover.• If outdoors, stay low to the ground.• Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground).• Seek shelter in a building if possible.• Stay away from windows.• If available, crouch under a group of trees instead of one single tree.• Keep all body parts in contact with the ground as close as possible.• Remain 6 feet away from tree trunk if seeking shelter beneath tree(s).• If in a group, keep 6 feet of distance between people. |
| | Thunderstorms, tornadoes | <ul style="list-style-type: none">• Listen to radio or TV announcements for pending weather information.• Cease field activities during thunderstorm or tornado warnings.• Seek shelter. Do not try to outrun a tornado. |
| | Slip, trip, fall | <ul style="list-style-type: none">• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field.• Provide adequate lighting in all work areas.• Whenever possible, avoid routing cords and hoses across walking pathways.• Flag or cover inconspicuous holes to protect against falls.• Work areas will be kept clean and orderly.• Garbage and trash will be disposed of daily in approved refuse containers.• Tools and accessories will be properly maintained and stored.• Work areas and floors will be kept free of dirt, grease, and slippery materials. |
| | Surveying | |
| | Traffic accidents | <ul style="list-style-type: none">• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians.• If working adjacent to roadways, have workers wear fluorescent orange vests.• Use warning signs or lights to alert oncoming traffic.• Assign flag person(s) if necessary to direct local traffic.• Set up temporary parking locations outside the immediate work area.• Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits.• Pedestrians have the right-of-way.• Wear seat belts when vehicles are in motion. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 13)

| Activity | Potential Hazards | Recommended Controls |
|-----------------------|---|--|
| Surveying (continued) | | |
| Wildlife hazards | <ul style="list-style-type: none">• Workers should be cautious when driving through the site in order to avoid encounters with passing animals. | |
| Biological hazards | <ul style="list-style-type: none">• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads). | |
| Ticks | <ul style="list-style-type: none">• Wear light colored clothing (can see ticks better).• Mow vegetated and small brush areas.• Wear insect repellent.• Wear long sleeves and long pants.• Visually check oneself promptly and frequently after exiting the work area. | |
| Poison ivy/oak/sumac | <ul style="list-style-type: none">• Avoid plant areas if possible.• Wear long sleeves and long pants.• Promptly wash clothing that has contacted poisonous plants.• Wash affected areas immediately with soap and water. | |
| Groundwater sampling | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none">• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.• Avoid skin contact with water.• Handle samples with care.• Only essential personnel will be in the work area.• Real-time air monitoring will take place before and during sampling activities.• All personnel will follow good hygiene practices.• Proper decontamination procedures will be followed.• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">• Use care when handling glassware.• Wear adequate hand protection. |
| Hazard communication | | <ul style="list-style-type: none">• MSDSs shall be obtained for chemicals brought on site.• Label all containers as to contents. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 13)

| Activity | Potential Hazards | Recommended Controls |
|----------------------------------|---|--|
| Groundwater sampling (continued) | Strains/sprains | <ul style="list-style-type: none">• Use the proper tool for the job being performed.• Get assistance if needed.• Avoid twisting/turning while pulling on tools, moving equipment, etc. |
| | Spills/residual materials | <ul style="list-style-type: none">• Absorbent material and containers will be kept available where leaks or spills may occur. |
| | Lighting | <ul style="list-style-type: none">• Adequate lighting will be provided to ensure a safe working environment. |
| | Unattended worker | <ul style="list-style-type: none">• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities. |
| | Cross-contamination and contact with potentially contaminated materials | <ul style="list-style-type: none">• Stop immediately at any sign of obstruction.• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.• Only essential personnel will be in the work area.• Real-time air monitoring will take place before and during sampling activities.• All personnel will follow good hygiene practices.• Proper decontamination procedures will be followed.• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| | Soil boring and surface/subsurface sampling | |
| | Cut hazards | <ul style="list-style-type: none">• Use care when handling glassware.• Wear adequate hand protection. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|---------------------------|---|
| Soil boring and surface/subsurface sampling (continued) | Slip, trip, fall | <ul style="list-style-type: none">Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field.Whenever possible, avoid routing cords and hoses across walking pathways.Flag or cover inconspicuous holes to protect against falls. |
| | Bees, spiders, and snakes | <ul style="list-style-type: none">Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas.Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms. |
| | Poison ivy/oak/sumac | <ul style="list-style-type: none">Avoid plant areas if possible.Wear long sleeves and long pants.Promptly wash clothing that has contacted poisonous plants.Wash affected areas immediately with soap and water. |
| | Cold stress | <ul style="list-style-type: none">Workers should wear insulated clothing when temperatures drop below 40°F.Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.Remove wet clothing promptly.Take breaks in warm areas.Reduce work periods as necessary.Layer work clothing. |
| | Access/egress hazards | <ul style="list-style-type: none">Use qualified and trained bushhog operator.Keep employees out of the bushhog work area.Utilize good housekeeping practices.Keep aisleways, pathways, and work areas free of obstruction.Clean ice or snow off of walkways or work stations.Use appropriate footwear for the task assigned. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 8 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|-------------------|--|
| Soil boring and surface/subsurface sampling (continued) | Heat rash | <ul style="list-style-type: none">Keep the skin clean and dry.Change perspiration-soaked clothing, as necessary.Bathe at end of work shift or day.Apply powder to affected area. |
| | Heat cramps | <ul style="list-style-type: none">Drink plenty of cool fluids even when not thirsty.Provide cool fluid for work crews.Move victim to shaded, cool area. |
| | Heat exhaustion | <ul style="list-style-type: none">Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature)Set up work/rest periods.Use the buddy system.Allow workers time to acclimate.Have ice packs available for use.Take frequent breaks. |
| | Heat stroke | <ul style="list-style-type: none">Evaluate possibility of night work.Perform physiological monitoring on workers during breaks.Wear body cooling devices. |
| | Lightning strikes | <ul style="list-style-type: none">Whenever possible, halt activities and take cover.If outdoors, stay low to the ground.Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground).Seek shelter in a building if possible.Stay away from windows.If available, crouch under a group of trees instead of one single tree.Keep all body parts in contact with the ground as close as possible.If in a group, keep 6 feet of distance between people. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 9 of 13)

| Activity | Potential Hazards | Recommended Controls |
|------------------------|--|---|
| Hydropunch sampling | Faulty or damaged equipment being utilized to perform work | <ul style="list-style-type: none">• All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition.• Equipment will be inspected before use and at the beginning of each shift.• Faulty/unsafe equipment will be tagged and if possible locked out.• Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so. |
| | Uneven terrain, poor ground support, inadequate clearances, contact with utilities | <ul style="list-style-type: none">• Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.• All mobile equipment and areas in which they are operated shall be adequately illuminated.• Whenever the equipment is parked, the parking brake shall be set.• Equipment parked on inclines will have the wheels chocked.• Inspect brakes and tire pressure on drill rig before staging for work.• Obtain trenching/drilling permit prior to operation. |
| Inexperienced operator | | <ul style="list-style-type: none">• Machinery and mechanized equipment shall be operated only by designated personnel.• Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement. |
| Jacks/outriggers | | <ul style="list-style-type: none">• Ensure proper footing and cribbing. |
| Falling objects | | <ul style="list-style-type: none">• Remove unsecured tools and materials before raising or lowering the derrick.• Stay alert and clear of materials suspended overhead. |
| Pinch points | | <ul style="list-style-type: none">• Keep feet and hands clear of moving/suspended materials and equipment.• Stay alert at all times! |
| Fire | | <ul style="list-style-type: none">• Mechanized equipment shall be shut down prior to and during fueling operations.• Have fire extinguishers inspected and readily available. |

Table 5-1

Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama

(Page 10 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|-------------------|---|
| Hydropunch sampling (continued) | Fall hazards | <ul style="list-style-type: none"> • Personnel are not allowed to work off of machinery or use them as ladders. • Use fall protection when working above 6 feet. |
| | Noise | <ul style="list-style-type: none"> • Hearing protection is mandatory above 85 dBA. |
| Contact with rotating or reciprocating machine part | | <ul style="list-style-type: none"> • Use machine guards; use long-handled shovels to remove auger cuttings. • Safe lockout procedures for maintenance work. |
| Heavy lifting | | <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift. |
| Slip, trip, and fall hazards | | <ul style="list-style-type: none"> • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. |
| Contact with potentially contaminated materials | | <ul style="list-style-type: none"> • Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized. |
| Drowning | | <ul style="list-style-type: none"> • Personal flotation devices (PFD) will be provided and worn by workers over or near water where the danger of drowning exists. • PFDs shall be inspected prior to and after each use. • Detective PFDs will be tagged and removed from service. • Ring buoys with at least 90 feet of line shall be provided and readily available at locations where employees are working over or adjacent to water. • Use the "buddy system." • Personnel trained in launching and operating the skiff shall be readily available during work hours. |
| Surface water/sediment sampling | Heavy lifting | <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. |
| Moving and shipping collected samples | Pinch points | <ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times! |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 11 of 13)

| Activity | Potential Hazards | Recommended Controls |
|---|--|--|
| Moving and shipping collected samples (continued) | Cut hazards | <ul style="list-style-type: none">Wear adequate hand protection. Use care when handling glassware. |
| Hazard communication Heavy lifting | | <ul style="list-style-type: none">Label all containers as to contents and associated size-up the lift.Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; |
| Material storage | Flammable and combustible liquids | <ul style="list-style-type: none">Store in NO SMOKING AREA.Fire extinguisher readily available.Transfer only when properly grounded and bonded. |
| Disposal of investigation-derived waste (IDW) (Forklift Operation) | Personnel injury, property damage, and/or equipment damage | <ul style="list-style-type: none">Use qualified and trained forklift operators.The operator shall not exceed the load capacity rating for the forklift.The load capacity shall be clearly visible on the forklift.Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Cross-contamination and contact with potentially contaminated materials | | <ul style="list-style-type: none">Stop immediately at any sign of obstruction.Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.Only essential personnel will be in the work area.Real-time air monitoring will take place before and during sampling activities.All personnel will follow good hygiene practices.Proper decontamination procedures will be followed.All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none">Use care when handling glassware.Wear adequate hand protection. |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

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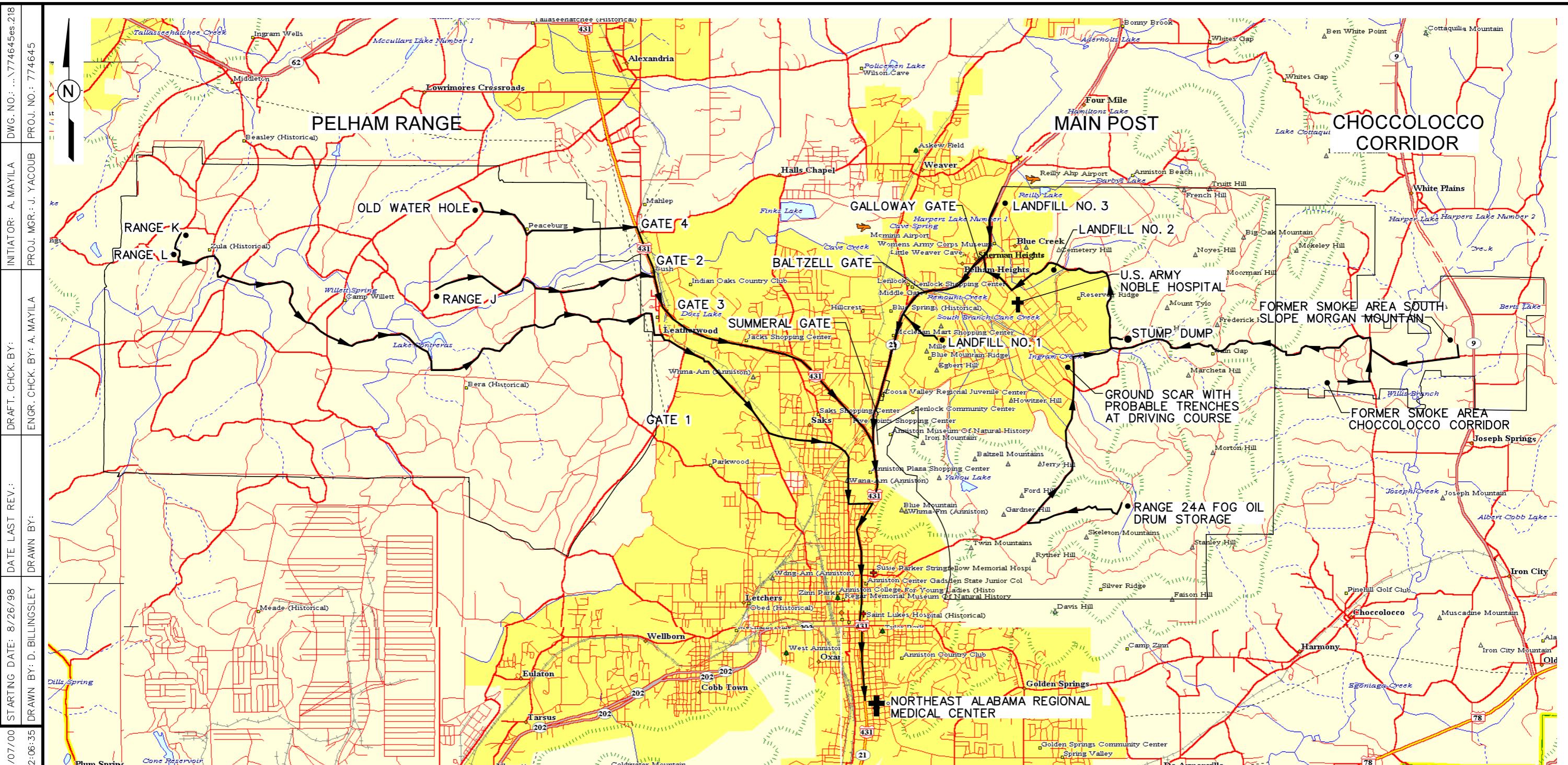
| Activity | Potential Hazards | Recommended Controls |
|--|--|----------------------|
| High-pressure water jetting operations | <p>Heavy lifting</p> <ul style="list-style-type: none">• Use proper lifting techniques.• Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. | |
| | <p>Slip, trip, and fall hazards</p> <ul style="list-style-type: none">• Good housekeeping shall be implemented.• The work area shall be kept clean as feasible.• Inspect the work area for slip, trip, and fall hazards. | |
| | <p>Fueling</p> <ul style="list-style-type: none">• Only approved safety cans shall be used to store fuel.• Do not refuel equipment while it is operating.• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. | |
| | <p>Faulty or damaged equipment</p> <ul style="list-style-type: none">• Equipment shall be inspected before being placed into service and at the beginning of each shift.• Preventive maintenance procedures recommended by the manufacturer shall be followed.• A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance. | |
| | <p>High-pressure water</p> <ul style="list-style-type: none">• Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate).• One standby person shall be available within the vicinity of the pump during jetting operation.• The work area shall be isolated and adequate barriers will be used to warn other site personnel. | |
| Unqualified operators | <ul style="list-style-type: none">• Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning. | |
| Out of control equipment | <ul style="list-style-type: none">• No machinery or equipment is permitted to run unattended.• Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded. | |
| Noise | <ul style="list-style-type: none">• Sound levels above 85 dBA mandates hearing protection by nearby site personnel. | |

Table 5-1

**Activity Hazard Analysis
Motor Pool Area 800
Fort McClellan, Calhoun County, Alabama**

(Page 13 of 13)

| Activity | Potential Hazards | Recommended Controls |
|--|---|---|
| High-pressure water jetting operations (continued) | Activation during repairs | <ul style="list-style-type: none">• All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. |
| | Pinch points | <ul style="list-style-type: none">• Keep feet and hands clear of moving/suspended materials and equipment.• Stay alert and clear of materials suspended |
| | Falling objects | <ul style="list-style-type: none">• Hard hats are required by site personnel.• Stay alert and clear of material suspended overhead. |
| | Flying debris | <ul style="list-style-type: none">• Impact-resistant safety glasses with side shields are required. |
| | Contact with potentially contaminated materials | <ul style="list-style-type: none">• All site personnel will wear the appropriate PPE. |



LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- 431 U.S. HIGHWAY
- ✚ HOSPITALS
- INVESTIGATION SITES

FIGURE 1
HOSPITAL EMERGENCY ROUTES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

**Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the
Former Gas Mask Test Chambers,
Parcels 195(7), 196(7), and 198(7)
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

October 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Final
Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7) at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

Date

Michael Henderson, CIH
Health & Safety Manager

Date

Jeff Tarr
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7) at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Site Coordinator

Date

Safety and Health Plan

Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7) at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

Date

Fort McClellan Gate Hours

| | |
|---------------|---|
| Baltzell Gate | Baltzell Road. Open 24 hours daily, 7 days a week. |
|---------------|---|

Fort McClellan Project Emergency Contacts

| | |
|---|----------------|
| Fire Department (on post) | Ext. 17 |
| Fire Department (off post) | (205) 820-1117 |
| Ambulance (on post) | Ext. 12 |
| Ambulance (off post) | (205) 848-2315 |
| Military Police (on post) | Ext. 5-3821 |
| Military Police (off post) | (205) 848-5555 |
| Regional Medical Center | (205) 235-5121 |
| Chemical Agent Emergencies | Ext. 17 |
| UXO Emergencies | Ext. 17 |
| UXO Nonemergencies/Reporting Only (Ronald Levy) | (205) 848-3758 |
| National Response Center | (800) 424-8802 |
| Poison Control Center | (800) 462-0800 |
| EPA Region IV | (404) 562-8725 |
| Ronald Levy, Chief, FTMC Environmental Management | (205) 848-3758 |
| Ellis Pope, U.S. Army Corps of Engineers | (334) 690-3077 |
| Jeanne Yacoub, IT Project Manager | (423) 690-3211 |
| Michael Henderson, IT H&S Manager | (423) 690-3211 |
| Dr. Elaine Theriault, IT Occupational Physician | (800) 229-3674 |

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List of Acronyms ---

| | |
|------|--|
| BZ | breathing zone |
| CN | chloroacetophenone |
| CS | o-chlorobenzylidenemalonitrile |
| FTMC | Fort McClellan |
| IT | IT Corporation |
| PPE | personal protective equipment |
| SHP | installation-wide safety and health plan |
| SSHP | site-specific safety and health plan |

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7).

Project Tasks

- Collect four surface soil samples.
- Collect four subsurface soil samples.

Personnel Requirements. Up to 10 employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP, Fort McClellan, Alabama.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

The Former Gas Mask Test Chambers site was used to test the performance and fit of gas masks. o-chlorobenzylidenemalonitrile (CS) "tear gas" is currently used at the gas mask test chambers. chloroacetophenone (CN) "tear gas" and nonpersistent chlorine gas were reportedly used in the past. It was reported that powdered CS was spread on the ground at this location during training exercises.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Former Gas Mask Test Chambers site.

2.2 General Site Information

Location of Site. The Former Gas Mask Test Chambers site is located south of Reilly Airfield, near 10th Street.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. The site elevation is approximately 770 feet, with ground sloping to the northwest.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are soils.

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 5)

| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route* | Symptoms of Exposure | Treatment | TWA° | STEL* | Source* | IDLH (NIOSH)' |
|---|----------|----------------------|--------------------------|--|---|----------------------------------|-----------------------------|-------------------|---------------|
| Acetone [67-64-1] | 9.7 | 13-100 | Inh Ing Con | Irritated eyes, nose, and throat; headache, dizziness; dermatitis. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 750 ppm 750 ppm 250 ppm | 1,000 ppm 1,000 ppm | PEL TLV REL | 20,000 ppm |
| Chlorine [7782-50-5] | 11.48 | ? | Inh Con | Burning of eye, nose, mouth; lacrimation, choking, cough, nausea, pulmonary edema. | Eye: Skin: Breath: Swallow: Frostbite Frostbite Respiratory support Immediate medical attention | 0.5 ppm | C 1 ppm 1 ppm 0.5 ppm | PEL TLV REL | 10 ppm |
| Chloroacetophenone [532-27-4] | 9.44 | ? | Inh Con Ing | Irritates eyes, skin, and respiratory system; pulmonary edema. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.05 ppm 0.05 ppm 0.05 ppm | PEL TLV REL | 15 mg/m³ | |
| CN (tear gas) See Chloroacetophenone | | | | | | | | | |
| CS (tear gas) See O-chlorobenzylidenemalononitrile | | | | | | | | | |
| O-chlorobenzylidene-malononitrile [2698-41-1] | ? | ? | Inh Con Ing Abs | Pain, burning eyes, lacrimation, conjunctivitis, erythema of eye lids, irritated throat, cough, chest tightness. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 0.05 ppm | CO.05 CO.05 | PEL TLV REL | 2 mg/m³ |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 5)

| Substance [CAS] | IP* (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|---|----------|----------------------|--------------------|---|---|---|----------------------------|---------------------|---------------------------|
| Fuel oil (diesel oil, medium) | ? | ? | Ing Inh Con | Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema, bronchopneumonia; excited, then depressed, central nervous system. | Eye: Skin: Breath: Swallow: Aspiration: | Irrigate promptly Soap wash Respiratory support Immediate medical attention Immediate medical attention | | PEL TLV REL | |
| n-Hexane [110-54-3] | 10.18 | 65-248 | Ing Inh Con | Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness. | Eye: Skin: Breath: Swallow: | Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention | 50 ppm 50 ppm 50 ppm | PEL TLV REL | 5,000 ppm |
| Hydrogen chloride (hydrochloric acid) [74-90-8] | 12.74 | 0.255-10.6 | Ing Inh Con | Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema. | Eye: Skin: Breath: Swallow: | Irrigate immediately Water flush immediately Respiratory support Immediate medical attention | C5 ppm C5 ppm C5 ppm | PEL TLV REL | 100 ppm |

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 3 of 5)

| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) ^f |
|--|-------------------------|----------------------------|--------------------------|--|---|---|--------------------------------------|---|------------------------------|
| Isopropyl alcohol (isopropanol) [67-63-0] | 10.16 | 43-200 | Inh Ing Con | Mild Irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush Respiratory support Immediate medical attention | 400 ppm 400 ppm 400 ppm | 500 ppm 500 ppm 500 ppm | PEL TLV REL | 12,000 ppm |
| Methanol | 10.85 | 4.2-5960 | Inh Abs Ing Con | Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | 200 ppm (skin) 200 ppm (skin) 200 ppm | 200 ppm (skin) 200 ppm 200 ppm | PEL TLV REL | 25,000 ppm |
| Methylene chloride (dichloromethane) [75-09-2] | 11.32 | ? | Inh Ing Con | Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; Irritated eyes and skin. | Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention | 500 ppm 50 ppm | 500 ppm 50 ppm | C1,000 ppm; C2,000 mg/m ³ (5 min in 2 hrs) | PEL TLV REL |
| Methyl ethyl ketone [78-93-3] | 9.54 | 2-85 | Inh Ing Con | Irritated eyes and nose; headache, dizziness; vomiting. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention | 200 ppm 200 ppm 200 ppm | 300 ppm 300 ppm 300 ppm | PEL TLV REL | 3,000 ppm |
| Nitric acid [7697-37-2] | 11.95 | 0.3-1 | Inh Ing Con | Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion. | Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Respiratory support Immediate medical attention | 2 ppm 2 ppm 2 ppm | 4 ppm 4 ppm 4 ppm | PEL TLV REL | 100 ppm |

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama**

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| Substance [CAS] | IP ^a (eV) | Odor Threshold (ppm) | Route ^b | Symptoms of Exposure | Treatment | TWA ^c | STEL ^d | Source ^e | IDLH (NIOSH) |
|------------------------------|----------------------|----------------------|--------------------|--|--|---|-------------------|-----------------------|----------------------|
| Portland cement | | | Inh | Fine gray powder that can be Irritating if inhaled or in eyes. | Eye: Soap wash immediately Skin: Respiratory support Breath: Immediate medical attention Swallow: Immediate medical attention | 10 mg/m ³ 10 mg/m ³ /total dust 5 mg/m ³ respirable fraction | | TLV PEL/REL | |
| Sodium hydroxide [1310-73-2] | NA | NA | Inh Ing Con | Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair. | Eye: Water flush immediately Skin: Respiratory support Breath: Immediate medical attention Swallow: Immediate medical attention | C2 mg/m ³ C2 mg/m ³ C2 mg/m ³ | PEL TLV REL | 250 mg/m ³ | |
| Sulfuric acid [7664-93-9] | ? | 0.15 | Inh Ing Con | Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis. | Eye: Water flush immediately Skin: Respiratory support Breath: Immediate medical attention Swallow: Immediate medical attention | 1 mg/m ³ 1 mg/m ³ 1 mg/m ³ | | PEL TLV REL | 80 mg/m ³ |

^aIP = Ionization potential (electron volts).^bRoute = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.^cTWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.^dSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.^ePEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEI = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

'IDLH (NIOSH)—immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respiratory failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. 1998).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

Table 2-1

**Toxicological and Physical Properties of Chemicals
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama**

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- NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.
 LC_{50} = Lethal concentration for 50 percent of population tested.
 LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

References:

- American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.
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- Fazzulluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
- Gemet, L. J. Van, Compilation of Odor Threshold Values In Air and Water, CIVO, Netherlands, 1977.
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- Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
- Micromedex Toxbase Plus (R) System, 1992, Micromedex, Inc.
- National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.
- National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.
- National Institute for Occupational Safety and Health Standards, American Industrial Hygiene Association, 1989.
- Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1993.
- Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
- Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
- Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
- Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

| Task | Initial Level of PPE |
|--------------------|----------------------|
| Staging equipment | Level D |
| Collecting samples | Modified Level D* |

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

-
- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
 - Latex boot covers
 - Nitrile, heavy work, or latex gloves
 - Steel-toed safety boots
 - Safety glasses
 - Hard hat
 - Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from Former Gas Mask Test Chambers site operations are chlorine, CN, and CS. Table 4-1 contains action levels for site monitoring at Former Gas Mask Test Chambers area.

Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the sampling location and BZs for combustible/flammable gas and oxygen levels that would necessitate evacuation of the work area. Table 4-2 contains the air monitoring frequency and location for site monitoring at the Former Gas Mask Test Chambers.

Table 4-1
Action Levels
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

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When in Level C PPE

| Analyte | Action Level | Required Action ^a |
|------------------|--|--|
| VOHs | ≥ 10 ppm above background in breathing zone (BZ) | Stop work, evacuate work area, upgrade to Level B. |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

When in Level D Modified/D PPE

| Analyte | Action Level | Required Action ^b |
|------------------|--------------------------------|---|
| VOHs | ≥ 5 ppm above background in BZ | Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE. |
| Oxygen | ≥ 20%, <23% < 20%, >23% | Normal operations. Stop work, evacuate work area. |
| Flammable vapors | ≥ 10% LEL < 10% LEL | Stop work, evacuate work area. Continue operations, monitor for VOCs. |

Table 4-1
Action Levels
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

When in Support Zone

| Analyte | Action Level | Required Action |
|---------|--------------------------------|---|
| VOHs | ≥ 1 ppm above background in BZ | Evacuate support zone and re-establish perimeter of exclusion zone. |

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2
Air Monitoring Frequency and Location
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

| Work Activity | Instrument | Frequency | Location |
|-------------------|--|------------------------------|----------------------------------|
| Staging equipment | OV Monitor | Initially for area | Breathing zone (BZ) of employees |
| Sampling (soil) | OV Monitor LEL/O ₂ Monitor | Continuously Continuously | BZ of employees Support zone |

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil sampling.

All injuries and illnesses must be immediately reported to the site manager or the site safety and health officer, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 11)

| Activity | Potential Hazards | Recommended Controls |
|---------------------------------|---|----------------------|
| Staging equipment | <ul style="list-style-type: none"> • Slip, trip, and fall hazards • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. • Look before you step; ensure safe and secure footing. | |
| Heavy lifting | <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment. | |
| Falling objects | <ul style="list-style-type: none"> • Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots. | |
| Flying debris, dirt, dust, etc. | <ul style="list-style-type: none"> • Wear safety glasses/goggles; ensure that eye wash is in proper working condition. | |
| Pinch points | <ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times! | |
| Cuts/bruises | <ul style="list-style-type: none"> • Use cotton or leather work gloves for material handling. | |
| Bees, spiders, and snakes | <ul style="list-style-type: none"> • Inspect work area carefully and avoid placing hands and feet into concealed areas. | |
| Ticks | <ul style="list-style-type: none"> • Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellent. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area. | |
| Fire | <ul style="list-style-type: none"> • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. | |
| Hazard communication | <ul style="list-style-type: none"> • Label all containers as to contents and dispose of properly. • Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site. | |
| Noise | <ul style="list-style-type: none"> • Sound levels above 85 decibels (dBA) mandates hearing protection. | |
| Lighting | <ul style="list-style-type: none"> • Adequate lighting will be provided to ensure a safe working environment. | |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 11)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|----------------------|---|
| Staging equipment (continued) | Cold stress | <ul style="list-style-type: none">• Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F).• Drink warm beverages on breaks.• Remove wet clothing promptly.• Take breaks in warm areas.• Reduce work periods as necessary.• Layer work clothing. |
| | Poison ivy/oak/sumac | <ul style="list-style-type: none">• Avoid plant areas if possible.• Wear long sleeves and long pants.• Promptly wash clothing that has contacted poisonous plants.• Wash affected areas immediately with soap and water. |
| | Heat rash | <ul style="list-style-type: none">• Keep the skin clean and dry.• Change perspiration-soaked clothing, as necessary.• Bathe at end of work shift or day.• Apply powder to affected area. |
| | Heat cramps | <ul style="list-style-type: none">• Drink plenty of cool fluids even when not thirsty.• Provide cool fluid for work crews.• Move victim to shaded, cool area. |
| | Heat exhaustion | <ul style="list-style-type: none">• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature)• Set up work/rest periods.• Use the "buddy system."• Allow workers time to acclimate.• Have ice packs available for use.• Take frequent breaks. |
| | Heat stroke | <ul style="list-style-type: none">• Evaluate possibility of night work.• Perform physiological monitoring on workers during breaks.• Wear body cooling devices. |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

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| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|--|--|
| Staging equipment (continued) | Contact with moving equipment/vehicles | <ul style="list-style-type: none">• Work area will be barricaded/demarcated.• Equipment will be laid out in an area free of traffic flow.• Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.• Barriers shall be used to protect workers from vehicular traffic.• Barriers shall be used to guard excavations adjacent to streets or roadways.• Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.• Heavy equipment shall have backup alarms. |
| Forklift operations | | <ul style="list-style-type: none">• Use qualified and trained forklift operators.• The operator shall not exceed the load capacity rating for the forklift.• The load capacity shall be clearly visible on the forklift.• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Portable electric tools | | <ul style="list-style-type: none">• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.• Portable electric tools and all cord and plug connected equipment shall be protected by a ground-fault circuit Interrupter (GFCI) device.• Electrical tools shall be inspected daily prior to use. |
| Extension cords | | <ul style="list-style-type: none">• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.• Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.• Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).• Cords shall be designed for hard duty.• Cords shall be inspected daily. |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 4 of 11)

| Activity | Potential Hazards | Recommended Controls |
|-------------------------------|-------------------------------------|---|
| Staging equipment (continued) | Lightning strikes | <ul style="list-style-type: none">• Whenever possible, halt activities and take cover.• If outdoors, stay low to the ground.• Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground).• Seek shelter in a building if possible.• Stay away from windows.• If available, crouch under a group of trees instead of one.• Keep all body parts in contact with the ground as close as possible.• Remain 6 feet away from tree trunk if seeking shelter beneath tree(s).• If in a group, keep 6' feet of distance between people. |
| | Thunderstorms, tornadoes | <ul style="list-style-type: none">• Listen to radio or TV announcements for pending weather information.• Cease field activities during thunderstorm or tornado warnings.• Seek shelter. Do not try to outrun a tornado. |
| | Slip, trip, and fall hazards | <ul style="list-style-type: none">• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field.• Provide adequate lighting in all work areas.• Whenever possible, avoid routing cords and hoses across walking pathways.• Flag or cover inconspicuous holes to protect against falls.• Work areas will be kept clean and orderly.• Garbage and trash will be disposed of daily in approved refuse containers.• Tools and accessories will be properly maintained and stored.• Work areas and floors will be kept free of dirt, grease, and slippery materials. |
| | Traffic accidents | <ul style="list-style-type: none">• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians.• If working adjacent to roadway's, have workers wear fluorescent orange vests.• Use warning signs or lights to alert oncoming traffic.• Assign flag person(s) if necessary to direct local traffic.• Set up temporary parking locations outside the immediate work area.• Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits.• Pedestrians have the right-of-way.• Wear seat belts when vehicles are in motion. |
| | Wildlife hazards | <ul style="list-style-type: none">• Workers should be cautious when driving through the site in order to avoid encounters with passing animals. |

Table 5-1

**Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 11)

| Activity | Potential Hazards | Recommended Controls |
|-----------------------|--|--|
| Surveying (continued) | | |
| | Biological hazards | <ul style="list-style-type: none">• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads). |
| | Ticks | <ul style="list-style-type: none">• Wear light colored clothing (can see ticks better).• Mow vegetated and small brush areas.• Wear insect repellent.• Wear long sleeves and long pants.• Visually check oneself promptly and frequently after exiting the work area. |
| | Poison ivy/oak/sumac | <ul style="list-style-type: none">• Avoid plant areas if possible.• Wear long sleeves and long pants.• Promptly wash clothing that has contacted poisonous plants.• Wash affected areas immediately with soap and water. |
| | Soil boring and surface/subsurface sampling | <ul style="list-style-type: none">• Stop immediately at any sign of obstruction.• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.• Only essential personnel will be in the work area.• Real-time air monitoring will take place before and during sampling activities.• All personnel will follow good hygiene practices.• Proper decontamination procedures will be followed.• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| | Cut hazards | <ul style="list-style-type: none">• Use care when handling glassware.• Wear adequate hand protection. |
| | Slip, trip, and fall hazards | <ul style="list-style-type: none">• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field.• Whenever possible, avoid routing cords and hoses across walking pathways.• Flag or cover inconspicuous holes to protect against falls. |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 6 of 11)

| Activity | Potential Hazards | Recommended Controls |
|---|---|----------------------|
| Soil boring and surface/subsurface sampling (continued) | Bees, spiders, and snakes <ul style="list-style-type: none">• Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas.• Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms. Poison ivy/oak/sumac <ul style="list-style-type: none">• Avoid plant areas if possible.• Wear long sleeves and long pants.• Promptly wash clothing that has contacted poisonous plants.• Wash affected areas immediately with soap and water. | |
| | Cold stress <ul style="list-style-type: none">• Workers should wear insulated clothing when temperatures drop below 40°F.• Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.• Remove wet clothing promptly.• Take breaks in warm areas.• Reduce work periods as necessary.• Layer work clothing. | |
| | Access/egress hazards <ul style="list-style-type: none">• Use qualified and trained bushhog operator.• Keep employees out of the bushhog work area.• Utilize good housekeeping practices.• Keep aisleways, pathways, and work areas free of obstruction.• Clean ice or snow off of walkways or work stations.• Use appropriate footwear for the task assigned. | |
| | Heat rash <ul style="list-style-type: none">• Keep the skin clean and dry.• Change perspiration-soaked clothing, as necessary.• Bathe at end of work shift or day.• Apply powder to affected area. | |
| | Heat cramps <ul style="list-style-type: none">• Drink plenty of cool fluids even when not thirsty.• Provide cool fluid for work crews.• Move victim to shaded, cool area. | |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 7 of 11)

| Activity | Potential Hazards | Recommended Controls |
|---|--|----------------------|
| Soil boring and surface/subsurface sampling (continued) | <p>Heat exhaustion</p> <ul style="list-style-type: none"> • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks. <p>Heat stroke</p> <ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices. <p>Lightning strikes</p> <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people. <p>Heavy lifting</p> <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. <p>Pinch points</p> <ul style="list-style-type: none"> • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times! <p>Cut hazards</p> <ul style="list-style-type: none"> • Wear adequate hand protection. Use care when handling glassware. <p>Hazard communication</p> <ul style="list-style-type: none"> • Label all containers as to contents and associated hazards. | |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

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| Activity | Potential Hazards | Recommended Controls |
|---|--|--|
| Moving and shipping collected samples (continued) | Heavy lifting | <ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. |
| Material storage | Flammable and combustible liquids | <ul style="list-style-type: none"> • Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded. |
| Disposal of investigation-derived waste (IDW) (Forklift Operation) | Personnel injury, property damage, and/or equipment damage | <ul style="list-style-type: none"> • Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement. |
| Cross-contamination and contact with potentially contaminated materials | | <ul style="list-style-type: none"> • Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations. |
| Cut hazards | | <ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection. |
| High-pressure water jetting operations | Heavy lifting Slip, trip, and fall hazards | <ul style="list-style-type: none"> • Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift. • Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards. |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 9 of 11)

| Activity | Potential Hazards | Recommended Controls |
|--|-----------------------------|--|
| High-pressure water jetting operations (continued) | Fuelling | <ul style="list-style-type: none"> • Only approved safety cans shall be used to store fuel. • Do not refuel equipment while it is operating. • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition. |
| | Faulty or damaged equipment | <ul style="list-style-type: none"> • Equipment shall be inspected before being placed into service and at the beginning of each shift. • Preventive maintenance procedures recommended by the manufacturer shall be followed. • A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance. |
| | High-pressure water | <ul style="list-style-type: none"> • Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). • One standby person shall be available within the vicinity of the pump during jetting operation. • The work area shall be isolated and adequate barriers will be used to warn other site personnel. |
| | Unqualified operators | <ul style="list-style-type: none"> • Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning. |
| | Out of control equipment | <ul style="list-style-type: none"> • No machinery or equipment is permitted to run unattended. • Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded. |
| | Noise | <ul style="list-style-type: none"> • Sound levels above 85 dBA mandates hearing protection by nearby site personnel. |
| | Activation during repairs | <ul style="list-style-type: none"> • All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. |
| | Pinch points | <ul style="list-style-type: none"> • Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert and clear of materials suspended . |
| | Falling objects | <ul style="list-style-type: none"> • Hard hats are required by site personnel. • Stay alert and clear of material suspended overhead. |
| | Flying debris | <ul style="list-style-type: none"> • Impact-resistant safety glasses with side shields are required. |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 10 of 11)

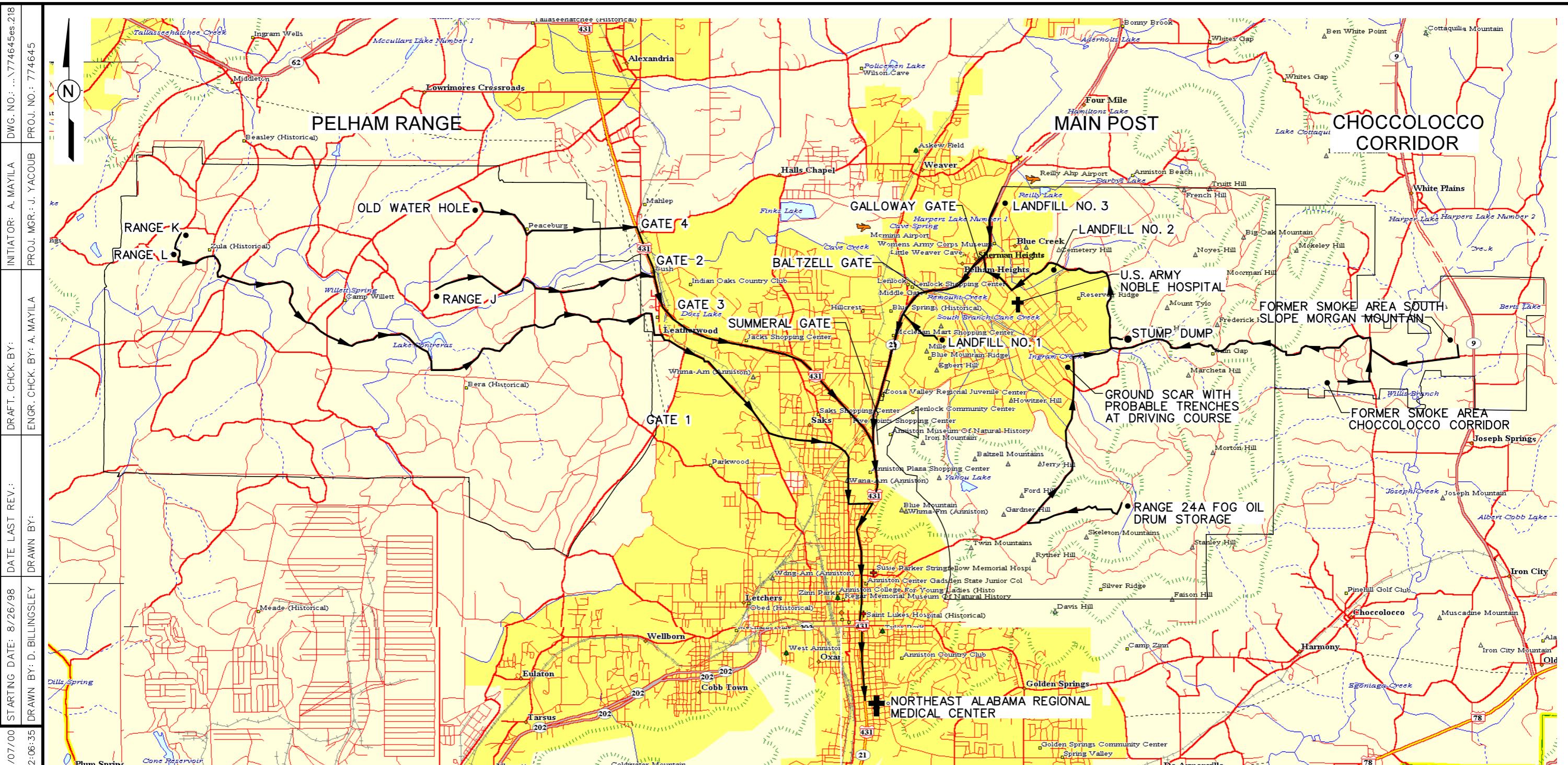
| Activity | Potential Hazards | Recommended Controls |
|--|--|--|
| High-pressure water jetting operations (continued) | Contact with potentially contaminated materials | <ul style="list-style-type: none"> • All site personnel will wear the appropriate PPE. |
| Hydropunch sampling | Faulty or damaged equipment being utilized to perform work | <ul style="list-style-type: none"> • All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition. • Equipment will be inspected before use and at the beginning of each shift. • Faulty/unsafe equipment will be tagged and if possible locked out. • Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it's safe to do so. |
| | Uneven terrain, poor ground support, inadequate clearances, contact with utilities | <ul style="list-style-type: none"> • Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. • All mobile equipment and areas in which they are operated shall be adequately illuminated. • Whenever the equipment is parked, the parking brake shall be set. • Equipment parked on inclines will have the wheels chocked. • Inspect brakes and tire pressure on drill rig before staging for work. • Obtain trenching/drilling permit prior to operation. |
| Inexperienced operator | | <ul style="list-style-type: none"> • Machinery and mechanized equipment shall be operated only by designated personnel. • Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement. |
| Jacks/outriggers | | <ul style="list-style-type: none"> • Ensure proper footling and cribbing. |
| Falling objects | | <ul style="list-style-type: none"> • Remove unsecured tools and materials before raising or lowering the derrick. • Stay alert and clear of materials suspended overhead. |
| Pinch points | | <ul style="list-style-type: none"> • Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert at all times! |
| Fire | | <ul style="list-style-type: none"> • Mechanized equipment shall be shut down prior to and during fueling operations. • Have fire extinguishers inspected and readily available. |

Table 5-1

Activity Hazard Analysis
Former Gas Mask Test Chambers, Parcels 195(7), 196(7), and 198(7)
Fort McClellan, Calhoun County, Alabama

(Page 11 of 11)

| Activity | Potential Hazards | Recommended Controls |
|---|---|----------------------|
| Hydropunch sampling (continued) | | |
| Fall hazards | <ul style="list-style-type: none">• Personnel are not allowed to work off of machinery or use them as ladders.• Use fall protection when working above 6 feet. | |
| Noise | <ul style="list-style-type: none">• Hearing protection is mandatory above 85 dBA. | |
| Contact with rotating or reciprocating machine part | <ul style="list-style-type: none">• Use machine guards; use long-handled shovels to remove auger cuttings.• Safe lockout procedures for maintenance work. | |
| Heavy lifting | <ul style="list-style-type: none">• Use proper lifting techniques. Lifts greater than 60 lbs. require assistance or mechanical equipment; size-up the lift. | |
| Slip, trip, and fall hazards | <ul style="list-style-type: none">• Practice good housekeeping; keep work area picked up and clean as feasible.• Continually inspect the work area for slip, trip, and fall hazards. | |
| Contact with potentially contaminated materials | <ul style="list-style-type: none">• Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized. | |



LEGEND

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
 - 431 U.S. HIGHWAY
 - ✚ HOSPITALS
 - INVESTIGATION SITES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

FIGURE 1 HOSPITAL EMERGENCY ROUTES